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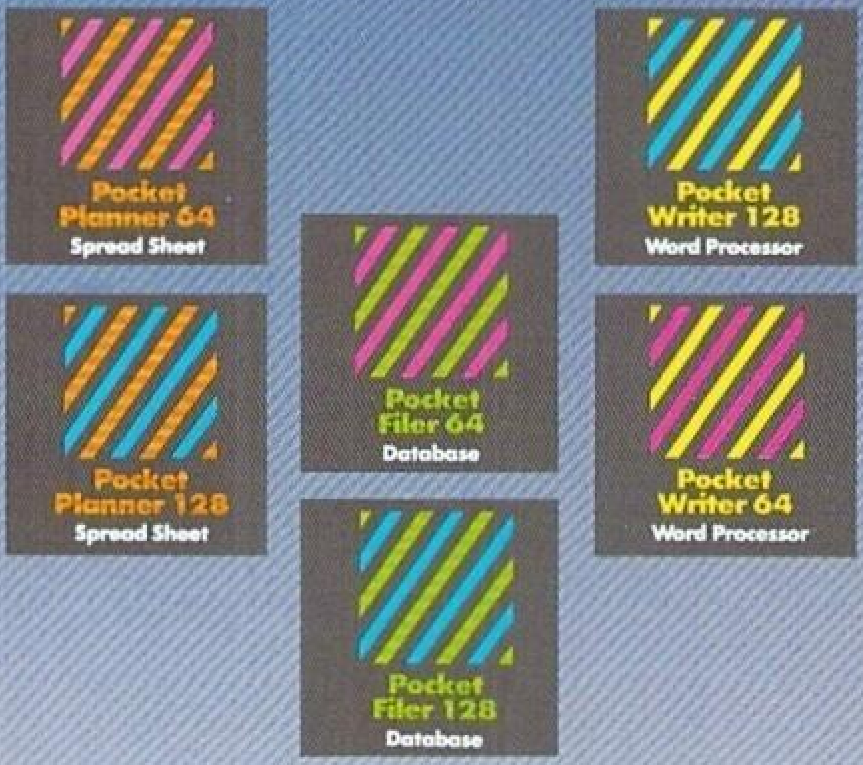

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Line Eraser

To the Editor:

After typing in a six-page program, it is handy to be able to extract a subroutine without having to type it over or press RETURN on each line number. This short routine will do it for you.

Your program must start with a line number that is greater than seven. Either merge your program behind Line Eraser or you can type Line Eraser in after you have loaded your program. Just replace START in line 1 with the first line number that you want to erase. START must be greater than seven. Replace STEP, in line 1 and line 6, with 1 if your program is numbered 10,11,12... or 10 if it is numbered 10,20,30... and so forth. Replace FINISH in line 5 with the last line number that you want to erase.

Brian Pfaffl
Sunnymead, California

Line Eraser

```
1 N=START:N=N-STEP:PRINT"[CLEAR,DOWN3]
  ";N:REM START IN #1-STEP IN #1 &
  #6-FINISH IN #5
2 PRINT"[HOME,DOWN4,SPACE12]"
  :PRINT"[SPACE12]":PRINT"[SPACE11]"
3 PRINT"[HOME,DOWN3,INST2]N=[HOME]"
  :POKE 198,7:POKE 631,13:POKE 632,71
  :POKE 633,79
4 POKE 634,84:POKE 635,79:POKE 636,53
  :POKE 637,13:END
5 IF N>=FINISH THEN PRINT"[CLEAR]":END
6 N=N+STEP:PRINT"[CLEAR,DOWN3]";N
  :PRINT"[HOME]":POKE 198,7
  :POKE 631,13
7 POKE 632,71:POKE 633,79:POKE 634,84
  :POKE 635,79:POKE 636,50:POKE 637,13
  :END
100 DATA
110 REM THIS IS DATSA
120 FOR X=1 TO 4
130 NEXT
200 PRINT"***"
210 DATA
220 END
```

END

Software Piracy

To the Editor:

As president of a small software company, I feel compelled to respond to George Zimmerman's letter in the June/July, 1986, issue. The controversy over software piracy and software protection is by no means a simple one, and there are valid points on both sides of this issue.

Zimmerman complains that software is "hype-advertised and overpriced." Anyone in consumer-directed businesses can attest to the fact that the American consumer is attracted by hype rather than facts. Companies that present muted advertising usually fail. This is true of automobiles and dishwasher detergent, as well as computer software. With so many products vying for the consumer dollar, sales depend on gaining the potential purchaser's attention.

With regard to his charge of overpricing, I would first like to comment that pricing for any kind of product is a matter of supply/demand balancing in the free marketplace. Many consumers do not appreciate the effort required in developing quality software for general consumption. Neither do they understand the high costs associated with marketing a product, nor the difference between the retail price and the revenues received by the producer. A software company typically sells its product to a distributor for about 40% of the retail price. Out of that 40% comes sales commissions to agents, royalties to the software author, advertising costs, reserves for bad debts, and, of course, the actual cost of production.

The charge that software protection schemes damage hardware is a bit dated. Most companies employing protection today are using techniques which will not cause hardware damage, although there are still products on the market that use disk-sector errors. Incidentally, it is not unreasonable of a software producer to expect the hardware to be able to handle disk errors without being damaged. Perhaps this particular complaint should be directed towards the *hardware* manufacturer.

Zimmerman further complains that multiple purchases are required to operate the same software from both home and office. He should be aware that the copyright laws prohibit *using* back-up copies of the same software; the consumer does have a right to make a back-up copy for *archival* purposes. He is not being cheated because he has to buy two copies in order to use the software in two locations simultaneously.

His last complaint, namely that software products often don't live up to his expectations based on advertising hype, is valid to some degree. However, even here, the problem is often one of misunderstanding of advertising claims by the unsophisticated consumer. How can he avoid software that makes "excessive" claims? First, he can join a user group and gain the experience of other users. Second, he and other users can demand that software magazines carefully select reviewers who are knowledgeable and unbiased, so that he can make purchasing

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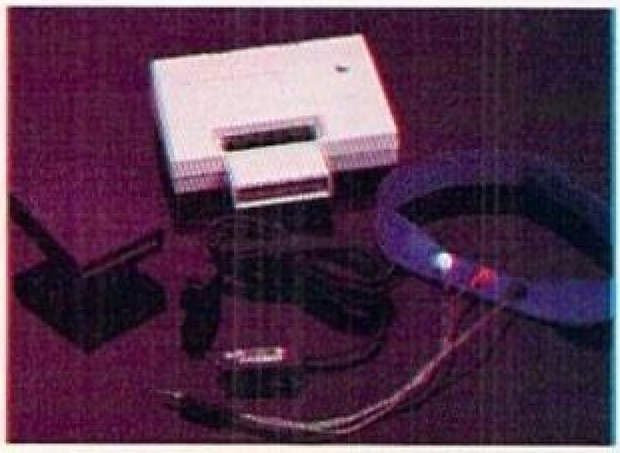

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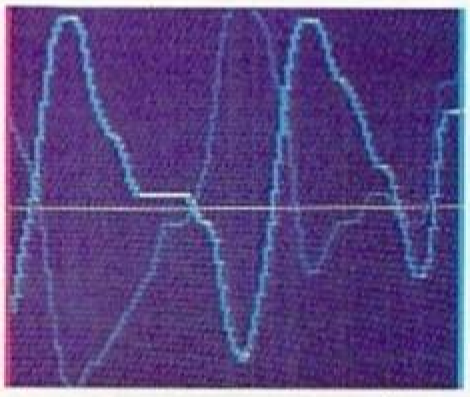

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LETTERS

Continued from pg. 4

decisions based on complete, critical reviews.

Joseph J. O'Hara
President, Microtechnic Solutions
New Haven, Connecticut

To the Editor:

This letter is in response to George Zimmerman's letter about programs with dongles in the June/July, 1986, issue. I come to the defense of dongled programs.

First of all, there is no wear and tear on my disk drive because of the lack of protection on the disk. Secondly, I can make as many back-ups as I want, and I can tailor the program to the various drives that I have. I have, for instance, a version of the programs on my 8250 drive as well.

Thirdly, since not many programs are dongled, it seems to me that he may have been referring to either *Paperclip, The Consultant* or perhaps *Flexfile* or *Vizawrite.* These happen to be among the best Commodore programs in their categories. *Superbase,* for instance, is undongled, and knocks the disk drive head terribly before the final load is complete. With the dongled programs *Paperclip* and *The Consultant,* I have never had any problems. Take another undongled program like *Pocket Writer.* The program is good, but you can't even load it normally. You have to boot it, which really puts a strain on the disk drive.

I have spent a great deal of money on my Commodore system, both in hardware and software. I am outraged to hear such prejudice about dongled programs. By the way, I do have an extra dongle for each of the programs, and they were available from Batteries Included at half the price of the program.

I wrote my whole dissertation on a Commodore 64 with *Paperclip,* and printed the final version myself. I didn't mind the dongle, because I knew I had one of the best available word processors for the 64.

Michael Habermanns
Baltimore, Maryland

To the Editor:

Jeffrey Hersk's article "Keyboard Cleanup" in the June/July, 1986, issue may not be the best way to clean your Commodore keyboards. Why? Because as a service engineer, I have cleaned many keyboards and switches, and I found a long time ago—scrubbing those gold dots with a pencil eraser can remove some, if not all, of the gold plating. I suggest using any contact cleaner applied with a swab. It is available at any electronic store. Ordinary de-natured alcohol will also do. Please don't use erasers—I know from experience.

Arnold J. Meyer
Van Nuys, California

Commodore Power/Play welcomes letters from readers. Please send them to:

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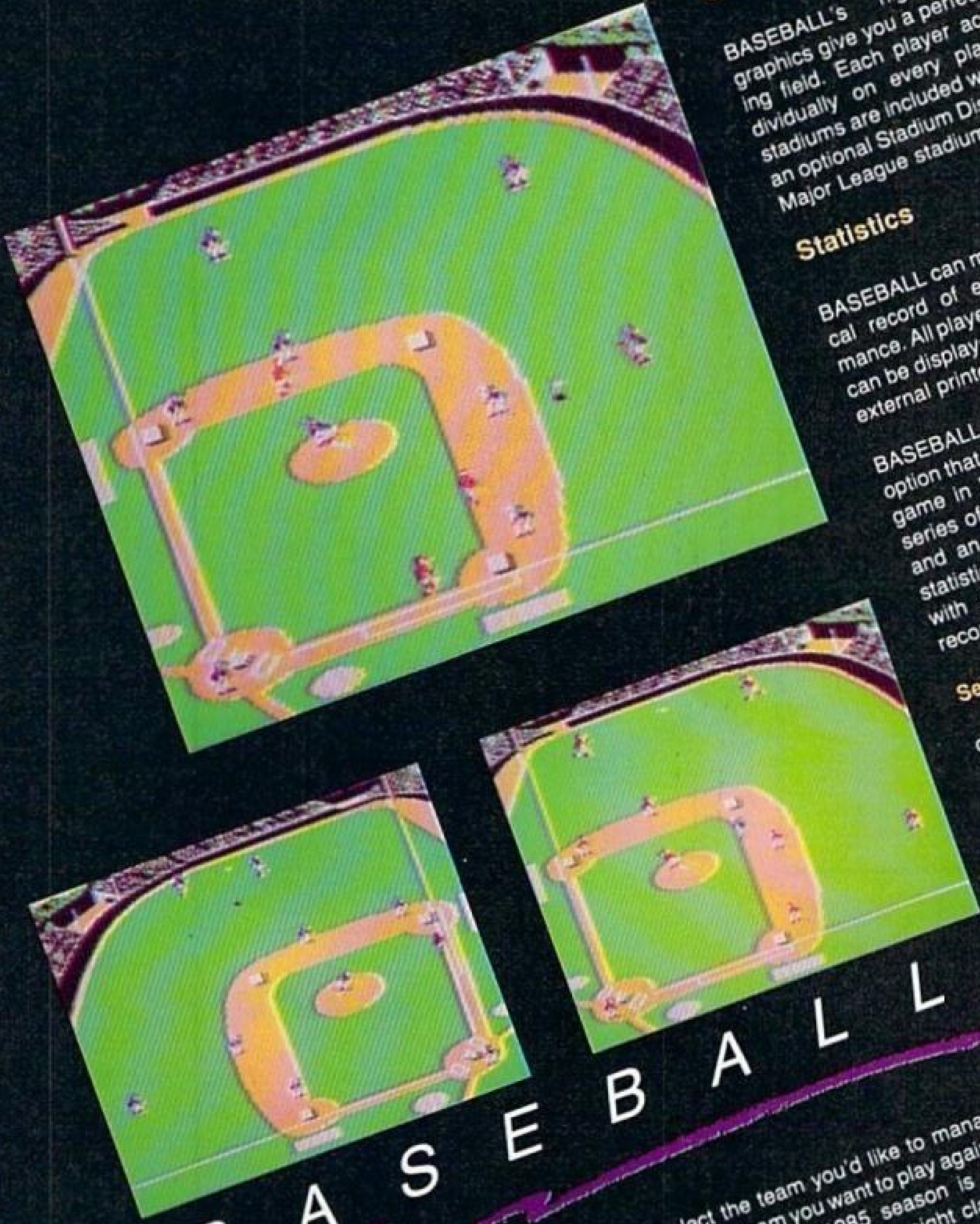
Attn: Letters



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Game Play

BASEBALL's underlying statistical framework simulates the realities of baseball like never before. Within this framework, the program considers each player's batting statistics against both left-handed and right-handed pitchers, and pitchers statistics vs. left- and right-handed batters. Every player's fielding and base-running abilities are also considered (an important factor when attempting to steal a base, etc.).

Select the team you'd like to manage, then pick the team you want to play against. Every team from the 1985 season is accurately represented, along with eight classic teams from the past. Determine your starting lineup, designate a starting pitcher, and make player substitutions when necessary. You call the plays, offense and defense. In a one-player game, your computer opponent displays uncanny intelligence in reacting to your managing decisions.

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Built-in manager's functions provide extra versatility. You can trade team players, draft new players, create your own team, even form your own league. The program's stat-tracker keeps track of your team's season statistics and individual player year-to-date stats.

Graphics

BASEBALL's highly-detailed animated graphics give you a perfect view of the playing field. Each player acts and moves individually on every play. Three different stadiums are included with the program, and an optional Stadium Disk lets you play in any Major League stadium in the United States.

Statistics

BASEBALL can maintain a complete statistical record of each team player's performance. All player stats and game Box Scores can be displayed on the screen or sent to an external printer for a hardcopy printout.

BASEBALL also includes a unique Auto-Play option that lets the computer play a complete game in less than three minutes. A whole series of games can be played unattended, and an entire season of player and team statistics can be compiled over several days with all game stats printed out for your records.

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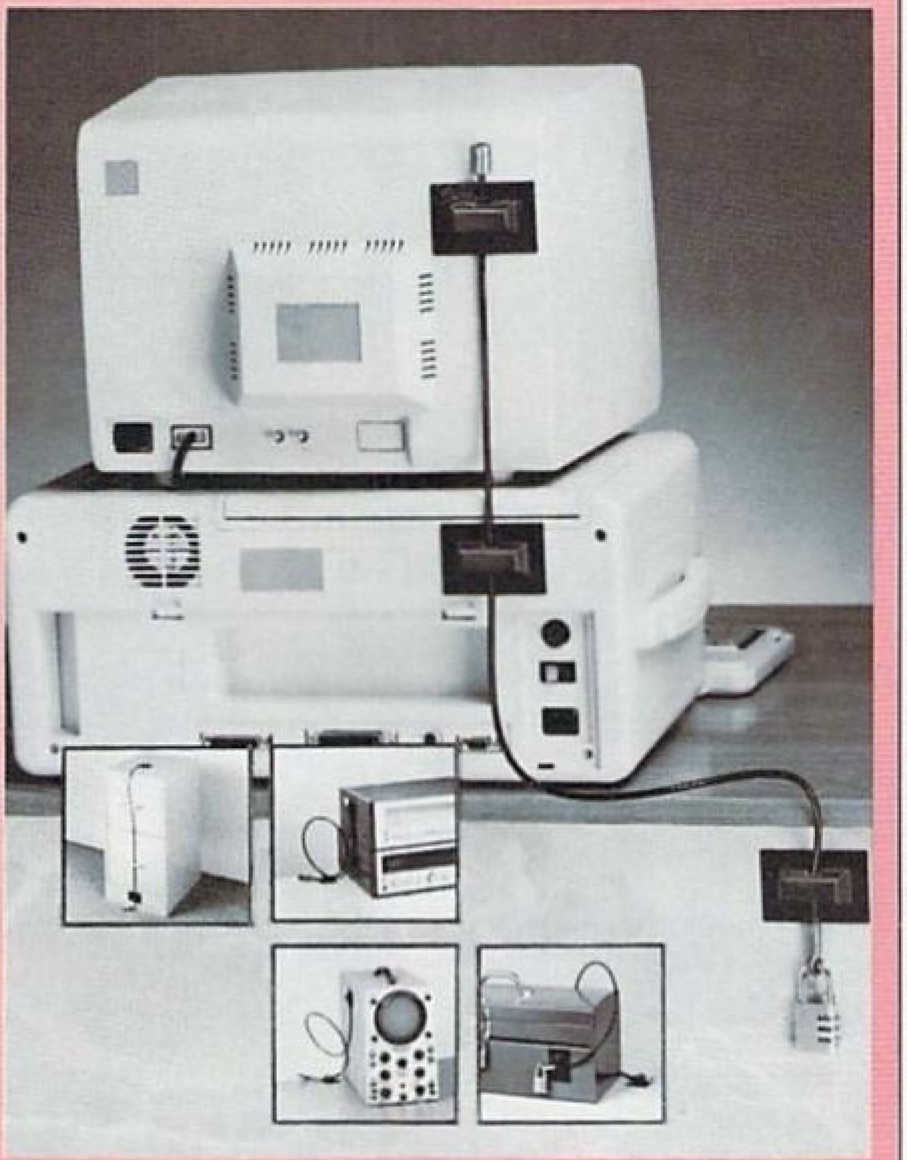
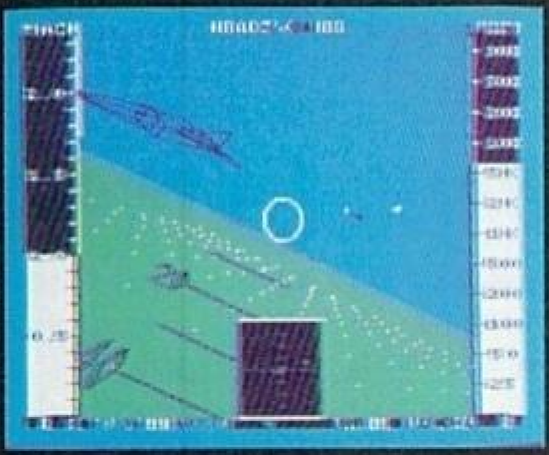


Computer Security

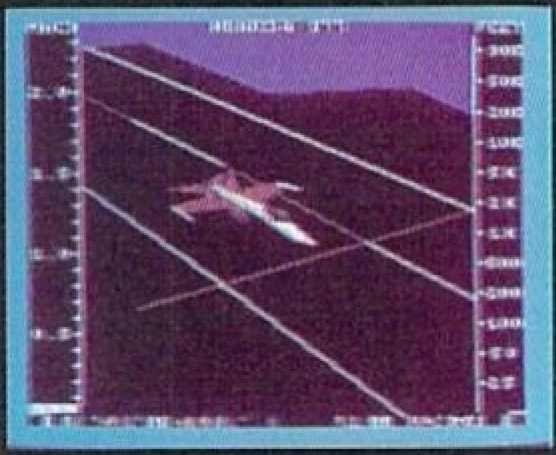
Technalock is a low cost way to secure computer equipment from theft. Pressure-sensitive adhesive bonds a strong securing plate to the equipment. A vinyl-coated steel cable and a lock complete the system. It can be installed out of sight at the rear of the computer and no tools are needed. It does not void the computer's warranty. The master system retails for $24.95 and expansion kits are available. (Business Security Systems, 512 South Hanley, St. Louis, MO 63105)

Flight Simulator Book

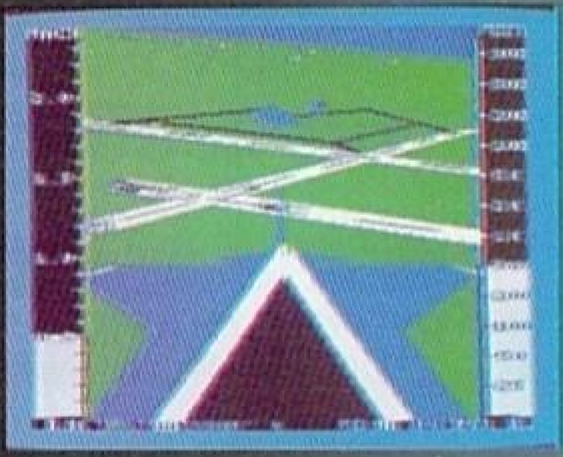
The Flight Simulator Book is a hands-on tutorial for SubLogic's **Flight Simulator II.** The author is your on-board instructor as you execute a series of flights that begin with aviation basics, then lead through the whole gamut of aviation procedures. You learn to do everything an airline captain does—using the dozens of real government aviation charts that are provided in the book. Coverage includes maneuvers, flight planning, cross country procedures, radio navigation and instrument landings. It is available from En Route Books, 6408 West College Drive, Phoenix, AZ 85033 for $19.95 plus $1.00 postage.



F-16 Dogfight with Enemy MiG-23 Fighters



F-18 on the Deck of a Nimitz-Class Aircraft Carrier (Control Tower View)



F-16 High-G Pullout over Detailed Wargame Scenery (Rear View)

Jet

From the author of Flight Simulator II comes a new dimension in realism. Jet simulates two fast and maneuverable supersonic jet fighters, a land-based F-16 or a carrier-based F-18. The simulator includes modern electronic flight instrumentation and the most advanced weaponry available. Jet's simulation sophistication, combined with excellent visual attitude references, makes it truly enjoyable to fly.

Easy aircraft control coupled with ballistic thrust gives you the kind of aerobatic maneuverability only a modern jet fighter can provide. Jet's attitude indicator is easy to read no matter what your orientation. A full-screen out-the-window view helps you get the most out of Jet's excellent flight controls. And that's a major consideration when flying at speeds in excess of 1300 MPH.

With Jet you can fly through either structured or non-structured environments. Engage in a deadly variety of combat missions. Explore the wargame territory, or relax by practicing precision aerobatic maneuvers. Load in scenery from optional United States Scenery Disks. You can even load in scenery off the Flight Simulator II disk.

New high-performance graphic drivers provide beautifully detailed scenery in either day or night-flight modes. You can look forward, left, right, rearward, or straight up out of the cockpit with a single keypress. The Jet simulator even includes a special view-magnification feature that lets you zoom-in to identify objects or details at a distance.

Jet will run on any Commodore 64 or Commodore 128 computer with one disk drive and either color or monochrome monitor.

See Your Dealer ... or write or call for more information. For direct orders please enclose $39.95 plus $2.00 for shipping and specify UPS or first class mail delivery. Visa, MasterCard, American Express, and Diners Club cards accepted.

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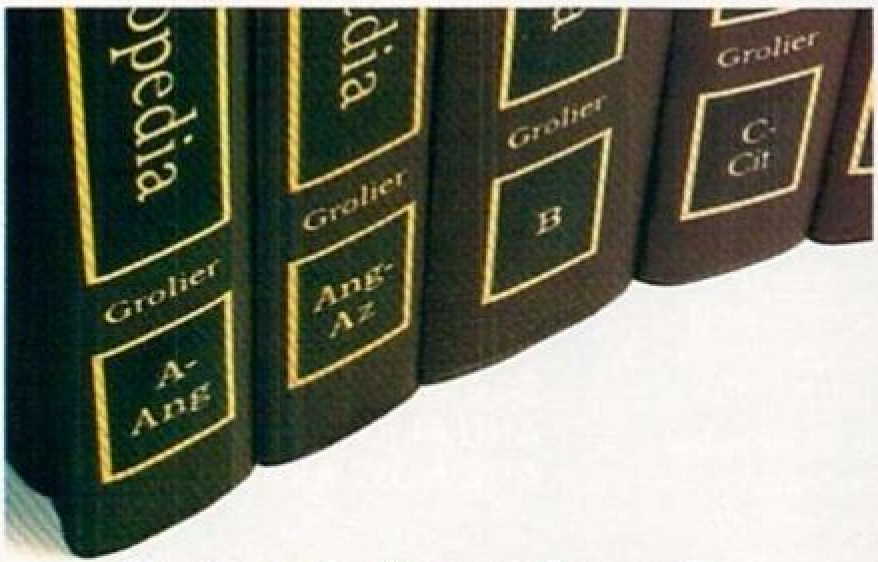

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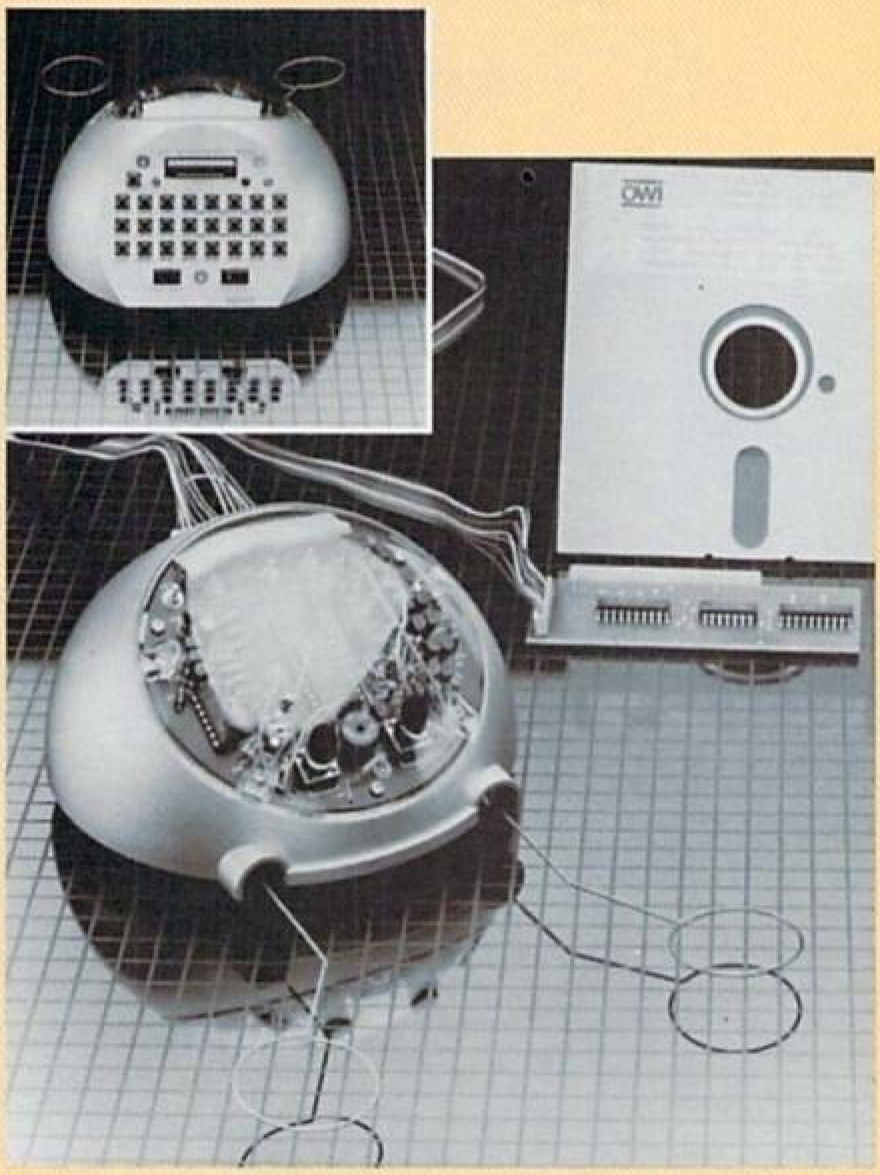
NEWS

C16 and Plus/4 Software

Robinson Software Associates (RSA) has announced the release of three software packages for the Commodore 16 and Plus/4. All three are available by mail from RSA for $9.95 each plus $1.50 postage.

Bounty Hunter is a full-length text adventure set in the old West. The object is to round up a gang of outlaws. **Grave Robbers** is a graphic adventure, and as the title implies, the player's goal is to find secret treasure at a gravesite. **Savings & Loan** is a home finance program that calculates principal and interest payments and amortization on loans, as well as the value of various types of savings. (RSA, 50 South Valley Road B2, Paoli, PA 19301)



Robot Kit

OWI, Inc. has expanded its Movit family of educational electronic robot kits. The newest member: WAO.

WAO comes with 64K RAM and is programmed directly via the keypad attached to it. A communications package is available for Commodore computers. It requires manual assembly and comes with the electronics presoldered and tested.

WAO has a sophisticated operating system which supports the development of programs which contain subroutines, branches and interrupts. The pen mechanism included with the robot allows it to draw straight lines, circles, words and short phrases.

For more information, contact OWI, Inc. at 1160 Mahalo Place, Compton, CA 90220 (213-638-4732)

Tokyo for $19.95

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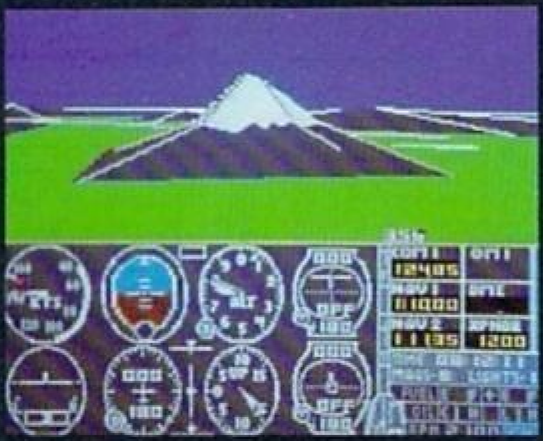
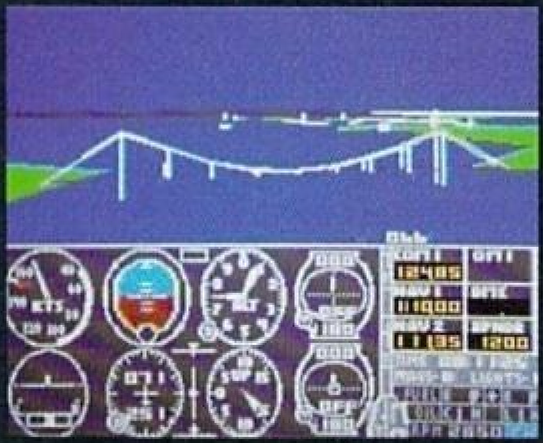
In the continuing evolution of scenery, SubLOGIC introduces the Japan and San Francisco Bay Area Scenery Disks for Flight Simulator II and Jet.

- Tokyo to Osaka is a comfortable 240-mile flight. The natural beauty of the Japanese coastline and mountain ranges complement the standard cross-country details.

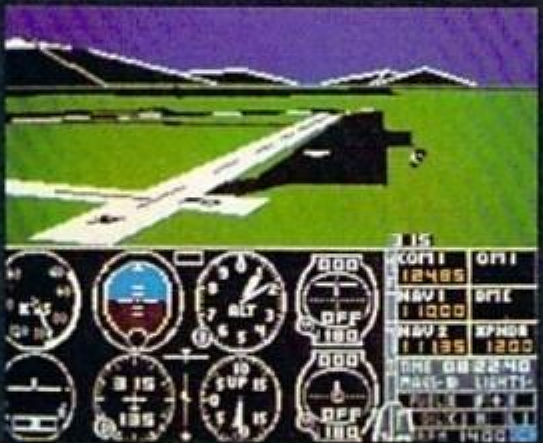


- The beautiful San Francisco Bay Area "Star" Scenery Disk is perfect for concentrated sight-seeing.



- For the cross-country adventurer, our standard Western U.S. scenery (Disks 1-6) contains major airports, nav-aids, cities, highways, rivers, lakes, and mountains.

SubLOGIC Scenery Disks are available individually for $19.95. The six-disk Western U.S. set is available for $99.95. See your dealer, or write or call SubLOGIC for more information.



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NEWS

Modem Connections Guide

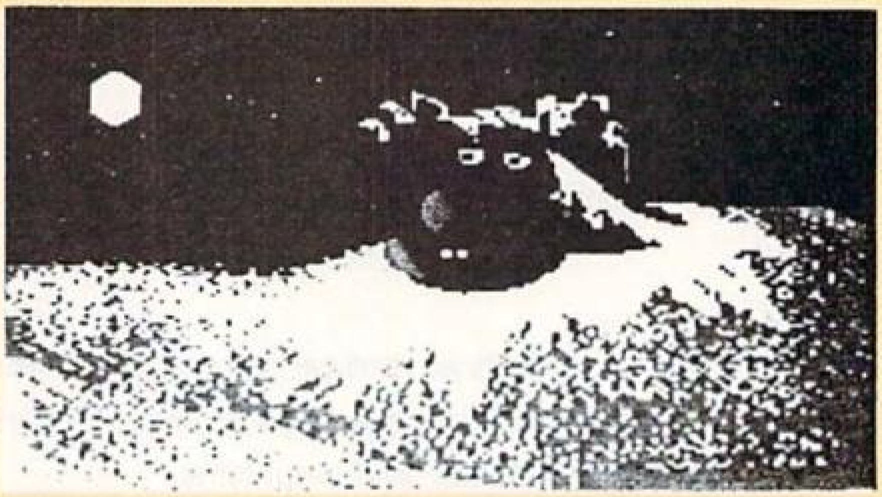
Howard W. Sams has released **Modem Connections Bible,** a book for those who want to connect a computer to a modem, interconnect several modems, are planning to buy a modem and need advice, or would just like to know more about modems.

The heart of the book is a collection of drawings of the RS-232-C interfaces, the interfaces on the modems, and the cables to connect the two. Written by Carolyn Curtis and Daniel Majhor, the book is 210 pages long and retails for $16.95. (Howard W. Sams, 4300 W. 62nd Street, Indianapolis, IN 46268)

Commodore 128 Tutorial

Activision has released **I Am the C128,** a hands-on tutorial that teaches Commodore 128 users how their computers work and provides an introduction to programming.

I Am the C128 divides information into nine chapters. In addition to illustrating key points, the book includes several practice programs so users can experiment with the information they have learned, such as drawing shapes and making sounds. It retails for $34.95. (Activision, 2350 Bayshore Frontage Road, Mountain View, CA 94043)



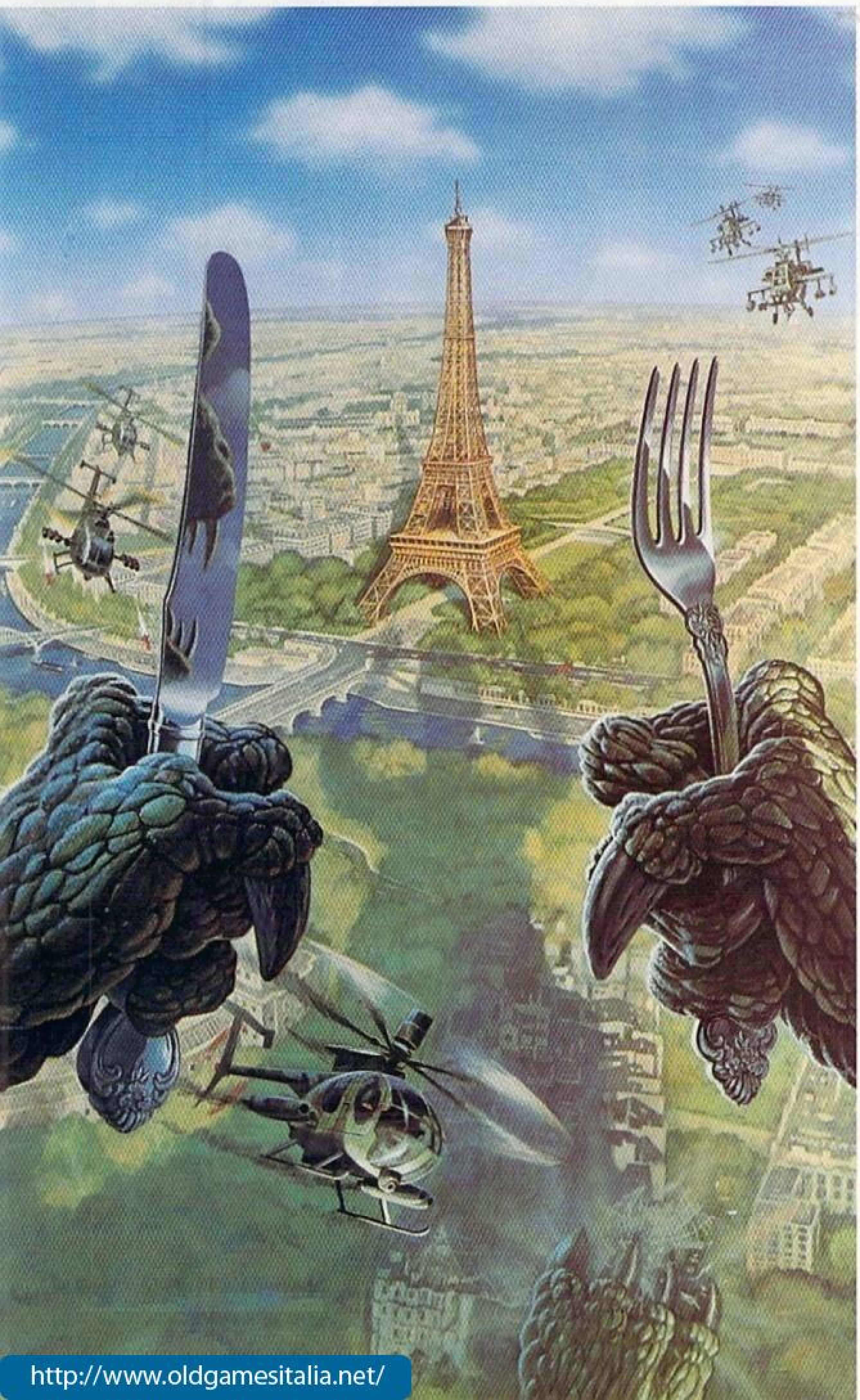
Christmas Adventure

BitCards, Inc. has released an enhanced version of its entertainment program, **A Christmas Adventure.** The program for the Commodore 64 is a text and graphics adventure set around Santa Claus' ice castle at the North Pole. Santa has mysteriously disappeared, and with Christmas only hours away, his annual gift delivery is in grave jeopardy. The player's mission is clear: Explore the castle and its surroundings, unravel the mystery of Santa's disappearance, and find and free him.

The game can be customized to include numerous personal references as well as a holiday greeting message. For anyone completing the game, BitCards is sponsoring a contest. The grand prize is a trip to the North Pole, where you can meet Santa Claus himself.

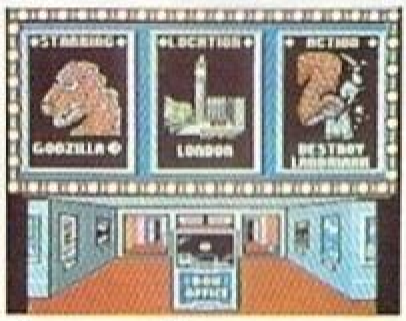
The game retails for $24.95 plus $3.00 for shipping/handling. (BitCards, Inc., P.O. Box 1289, Champlain, NY 12919, 514-274-1103)

Paris for breakfast, Tokyo for lunch and the Golden Gate Bridge for dinner.



Here's a switch. Instead of running from monsters, you *are* the monster.

Your choice of Godzilla.© The Glog. A Giant Tarantula. Mechatron Robot.



Or others equally unsavory.

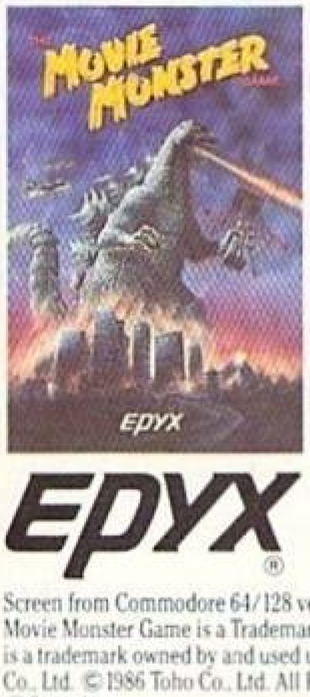
What's your favorite city? Paris? Tokyo? New York? London? How about Moscow?

Yeah. A nice little trip to eat the Kremlin would be pleasant. Or how about a daring rescue in the Big Apple. A bold escape near Big Ben. Or just gobbling up the Golden Gate for good.

But don't expect a warm welcome. Expect everything else those pesky humans can throw at you. Tanks. F-111 fighters. Cops. The Army, Navy, Air Force and Marines. Even a nuke now and then.

Stop complaining. You know very well you had it coming.

You monster you.



Apple II
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Screen from Commodore 64/128 version of game. The Movie Monster Game is a Trademark of Epyx, Inc. Godzilla is a trademark owned by and used under license from Toho Co., Ltd. © 1986 Toho Co., Ltd. All Rights Reserved. © Epyx, Inc.

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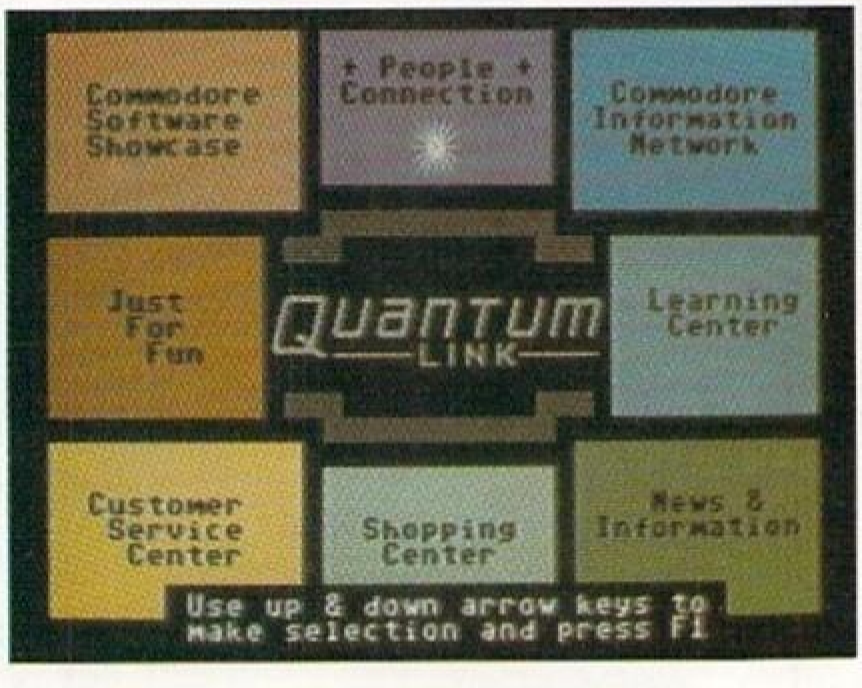
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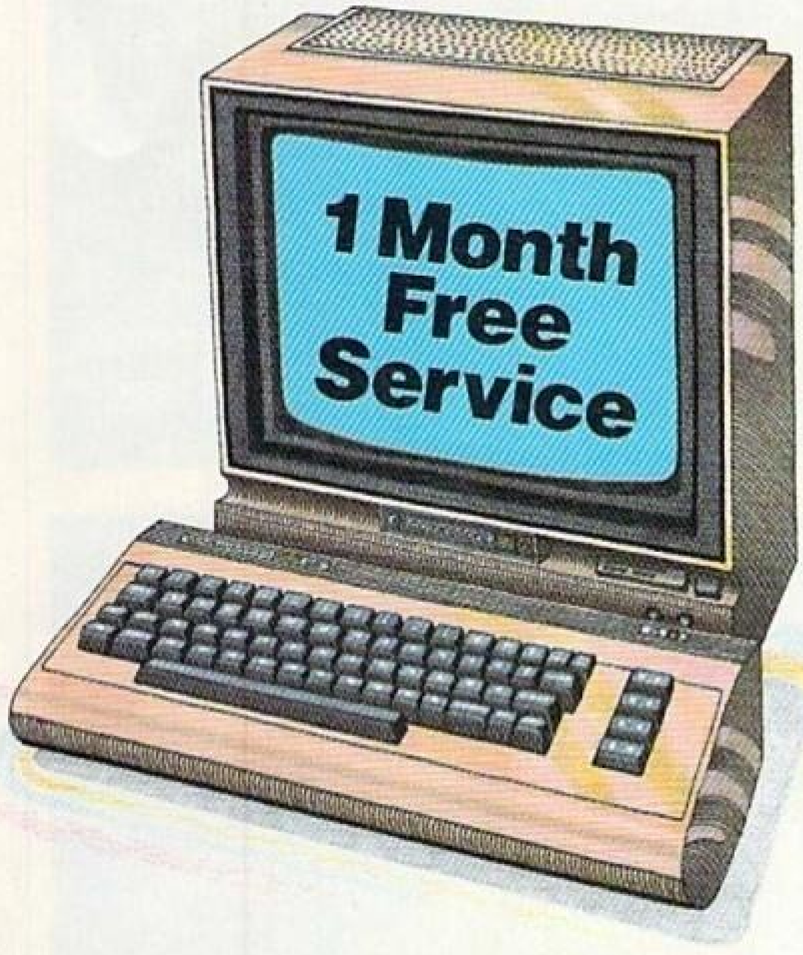

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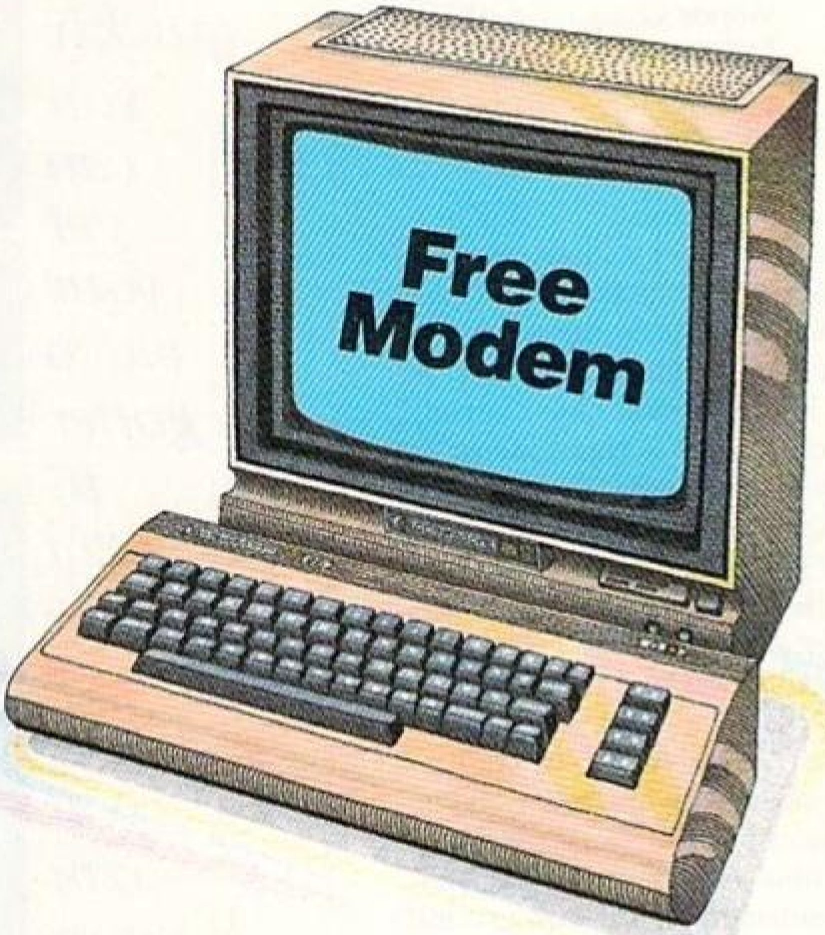

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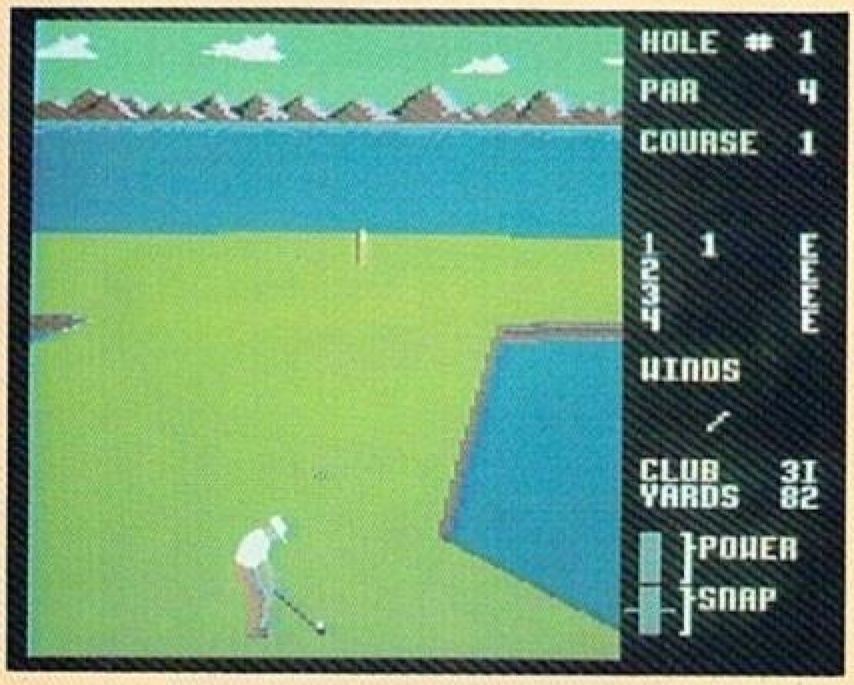
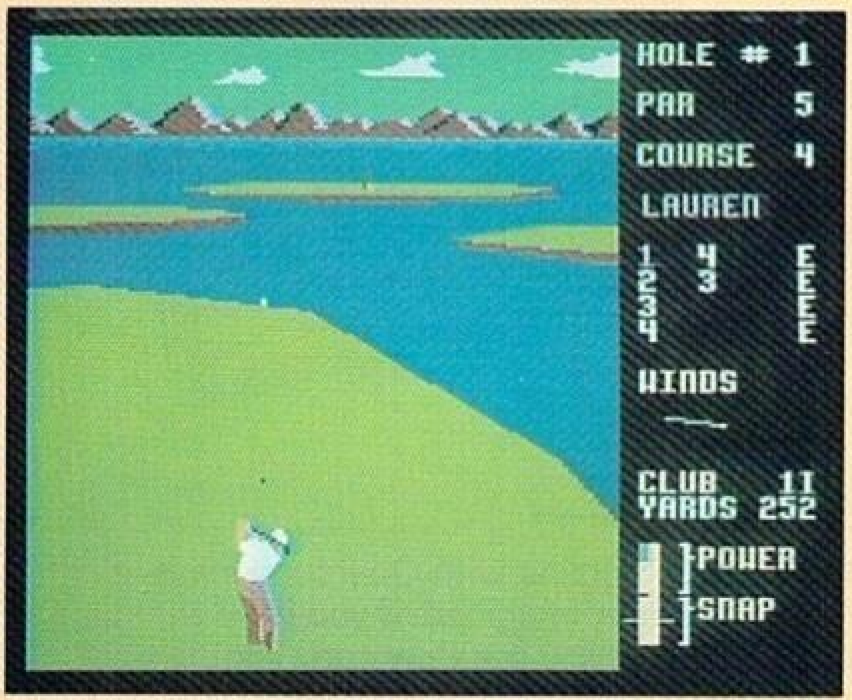
REVIEWED BY MARK COTONE

Leader Board

Computer: Commodore 64
Publisher: Access Software
2561 South 1560 West
Woods Cross, UT 84087
Medium: Disk
Price: $34.99

You'll marvel at how quickly you can get your video golfer to perform those tricky shots you can never pull off for real.





If there is any collective weakness to the cartload of golf simulations currently available for the Commodore 64, it's aesthetics. There is more to the game than just measuring distances, checking obstructions and choosing clubs. Anyone who has ever spent a warm afternoon hiking across sun-soaked fairways and freshly cut putting greens can tell you that. There's a beauty to golf that goes beyond the actual mechanics of play. With *Leader Board*, Access Software has put beauty back where it belongs.

Instead of following play from the usual overhead perspective, *Leader Board* provides a vantage slightly above and behind the golfer, just like Sunday television coverage. Your joystick-controlled golfer stands positioned in the foreground, looking out over a lush emerald course that unfolds in three-dimensional graphics. Brown, barren mountains give the horizon a jagged edge, a few whipped clouds dot the light blue sky, and a flag hangs on a distant green. It's a perfect day for golf.

Four 18-hole courses are groomed and ready for play, with trap placement, pin position and ground contours making each hole unique. To simplify the layout and rules of the contest, the designers have eliminated every type of fairway obstacle except for the most intimidating: the water hazard. These can be found everywhere, almost as if the course were constructed in the middle of a half-drained lake bed. This irregular design leaves little room for error, with many holes requiring island-hopping expertise.

A computerized caddy gives you a hand, and there is a screen display of wind speed, direction, and distance to the green. Once this is considered, it's time to put the ball in flight. After choosing a club from 13 woods and irons, you aim the shot, set the stroke's power, adjust your "wrists" to dictate the ball's curve, and swing away. It sounds complicated, but it is easily done by a few joystick tugs and taps. You'll marvel at how quickly you can get your video golfer to perform those tricky shots you can never pull off for real.

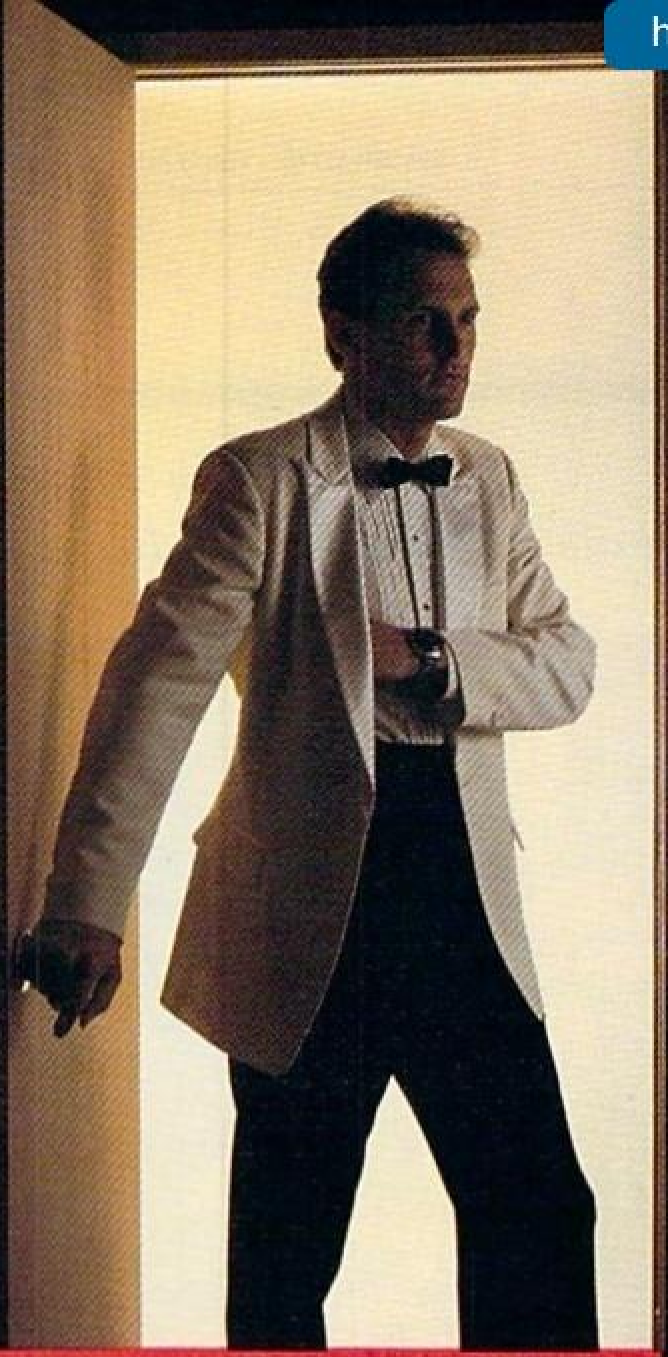
The animation is superb. Your player swings with fluid motions, sending shots arcing into the fairway, silently touching down with a bounce and a roll. When your ball catches water, it will skip and splash. If your putt is too strong, it will rim the cup and dance to the side. It's all smooth and believable, punctuated by dabs of appropriate sound.

With all of its sensational surface appeal, it's easy to miss the depth and credibility of this game's features. The range of each golf club is accurate, comparable to the distances that might be achieved by a semi-pro. The trajectory and flight of the ball are precise and realistic, with the longer clubs picking up that extra bounce and extended roll. And all the putting surfaces are pitched, creating tough lies that require a delicate touch.

Up to four players can golf together, and the program counts strokes and updates the leader board after each hole. There's a driving range where you can loosen up, with 72 holes of three skill levels. Wind effect, slice and hook are all variables that can be adjusted to match a player's ability. And if you ever become seasoned enough to shoot consistent birdie golf on these four links, Access has a Tournament Disk with four additional courses and an Executive version of the game to come.

No greens fees, no two-hour waits, no rain delays: Only the desirable aspects of golf have been included in *Leader Board*.

Continued on pg. 125



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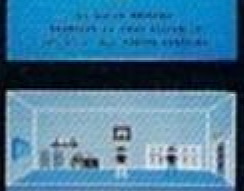

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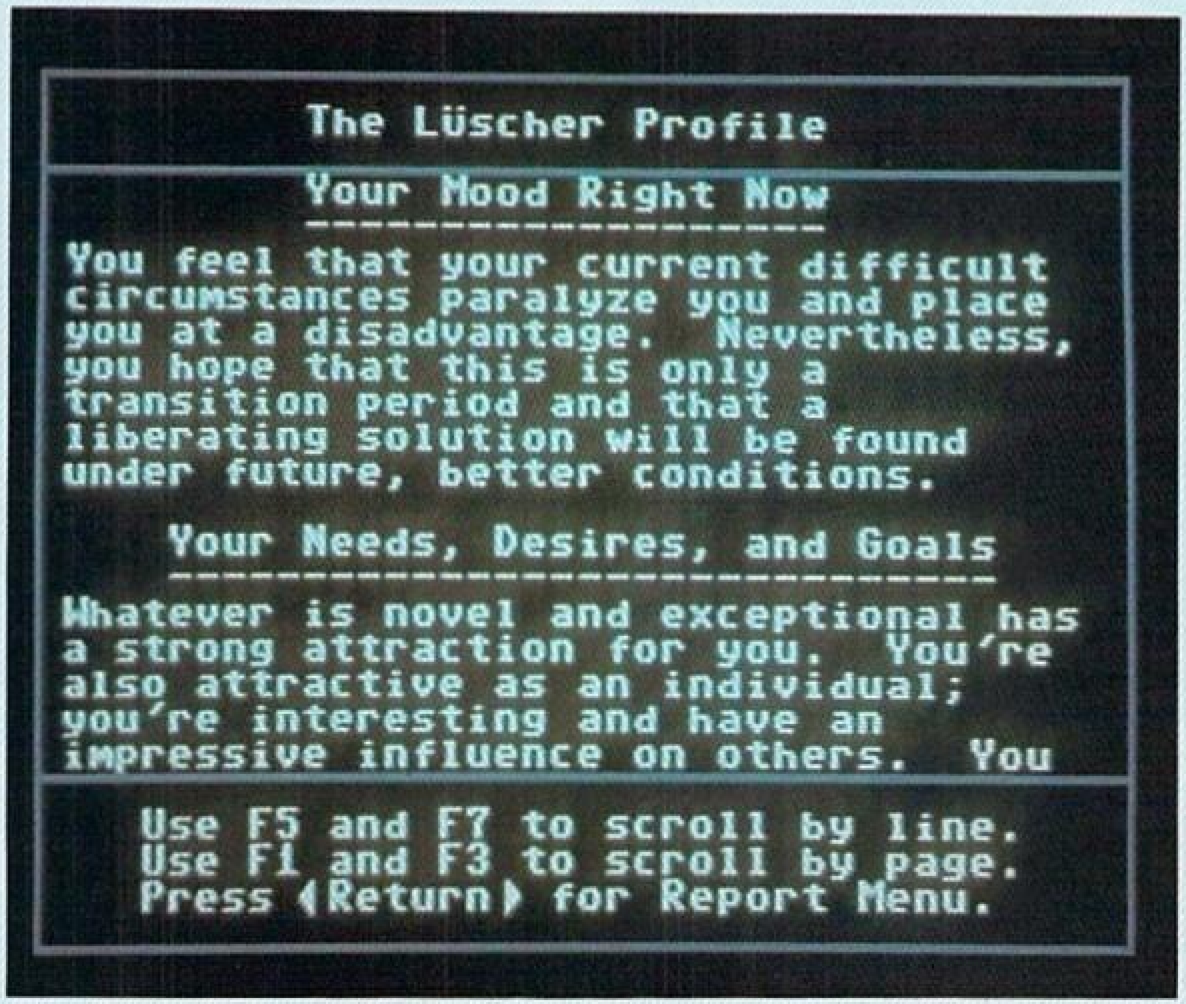
REVIEWED BY CHRISTINE ADAMEC

The Luscher Profile

Computer: Commodore 64
Publisher: Mindscape
3444 Dundee Road
Northbrook, IL 60062
Medium: Disk
Price: $29.95

The Luscher Profile *tells you what your color and shape preferences reveal about your personality.*



```
The Lüscher Profile
Your Mood Right Now
-------------------
You feel that your current difficult
circumstances paralyze you and place
you at a disadvantage.  Nevertheless,
you hope that this is only a
transition period and that a
liberating solution will be found
under future, better conditions.

Your Needs, Desires, and Goals
------------------------------
Whatever is novel and exceptional has
a strong attraction for you.  You're
also attractive as an individual;
you're interesting and have an
impressive influence on others.  You

Use F5 and F7 to scroll by line.
Use F1 and F3 to scroll by page.
Press ◀Return▶ for Report Menu.
```

Analyze your personality by the colors and shapes you like the best? Sounds kind of crazy, but it's really possible with *The Luscher Profile*, a program by Mindscape which provides eerily on-target results.

Dr. Max Luscher is a Swiss psychologist who has spent most of his career analyzing the color preferences of individuals and what those preferences reveal about their personalities. According to the manual, Luscher's color test is used worldwide by physicians and psychologists.

The program is comprised of seven simple tests, using a test booklet to choose from various colors and shapes. It's essential to see the exact hues of colors used by Dr. Luscher, which is why you must use the booklet.

You start off with blocks of black, gray and white, and choose the ones you like best, then second-best, and on down the line. Next are bright colors like oranges, purples and yellows. The other tests are varying shades of blues and greens, with the exception of the shape test, which includes shapes like circles and diamonds.

The test is very easy to take and you can run through it in about 10 to 15 minutes. There's no way to know what's the "right" answer, so you can't fake it. After you've entered your answers, you can save your data on a formatted disk, or the program will format one for you. Then print out your results or order an on-screen analysis. You can also protect your identity by using a password for your file.

If you're so impatient to see your analysis that you can't bear to wait the few moments while your file is being saved, you can opt to print out right away. The program will then ask you if you'd like to save (so you can't forget).

I started evaluating the program by running it twice about a week apart when I was in very different moods. The first time I was overworked, and the second time I was anticipating the weekend. My results were somewhat different each time, but had no radical differences.

According to my first run, my "needs, desires and goals" indicated that "whatever is novel and exceptional has a strong attraction for you...You're interesting and have an impressive influence on others."

One week later my results were "You pursue your interests with great enthusiasm and personal commitment...You consider your concerns meaningful and important." Also, I was still supposedly a person "capable of exercising an impressive influence on others." Both analyses were pretty similar.

You're also given an analysis of your current mood, what motivates your behavior, how you should cope with stress and problems, your attitude toward emotional involvements, why you act the way you do, how you respond to challenges, and what you expect from the future. Your analysis is concluded with advice targeted to your situation, entitled "Things to Consider." The entire report is about two single-spaced pages long.

Several friends also tried the program and were shocked by the results, which were very close to the truth. For example, one person was told, "You find your current situation nerve-wracking and intolerable...You're pushing yourself, and you feel you can't afford to display any weakness." The man who got these results was working on a tough project which was due imminently, and he was nervous about it.

He was advised to, "Ask yourself constantly if you have properly found your niche in life," and, "Do everything you can to promote physical relaxation and mental contentment; relaxation exercises, self-hypnosis, relaxing in a whirlpool."

Continued on pg. 123

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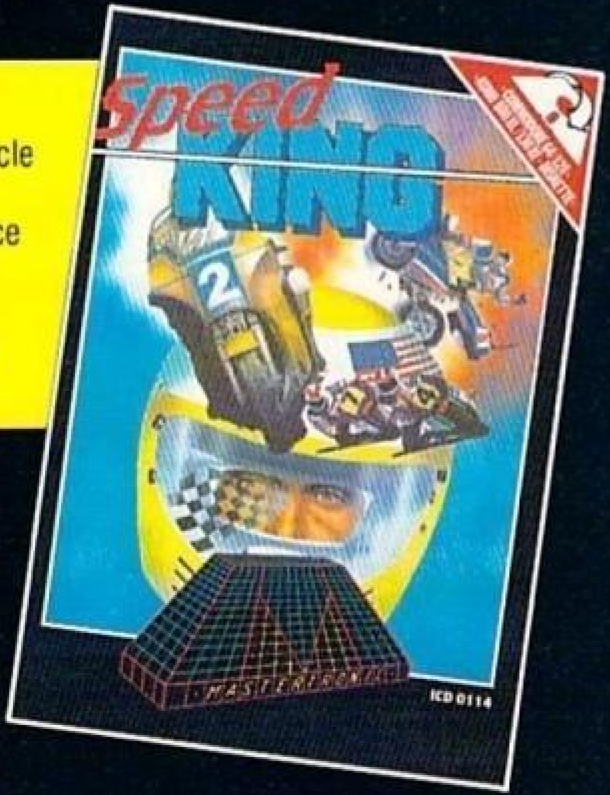
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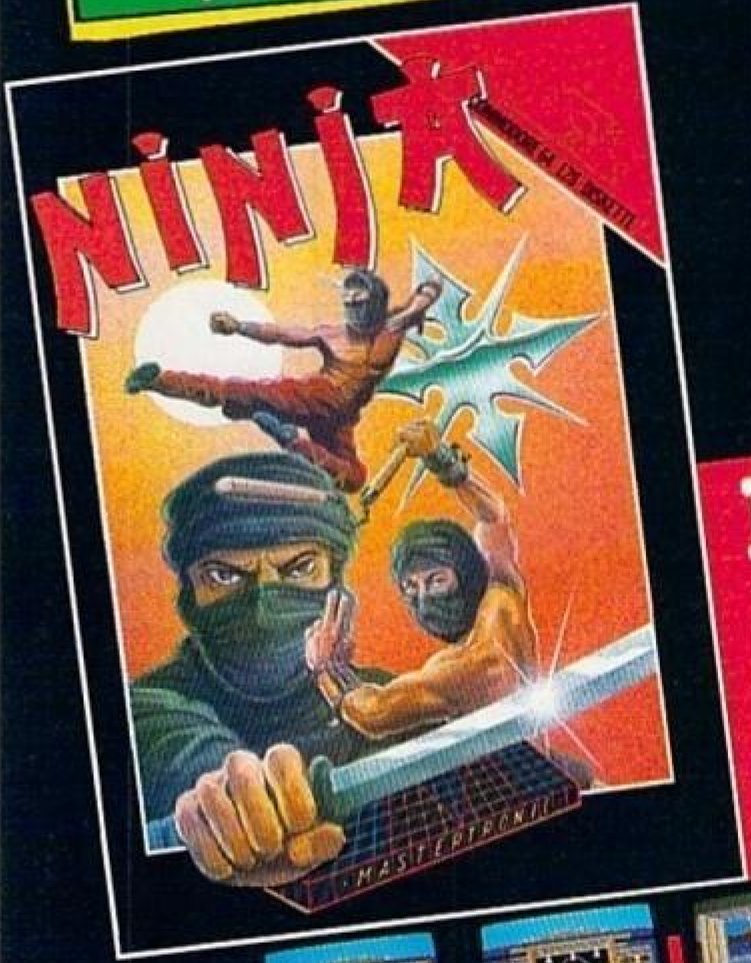
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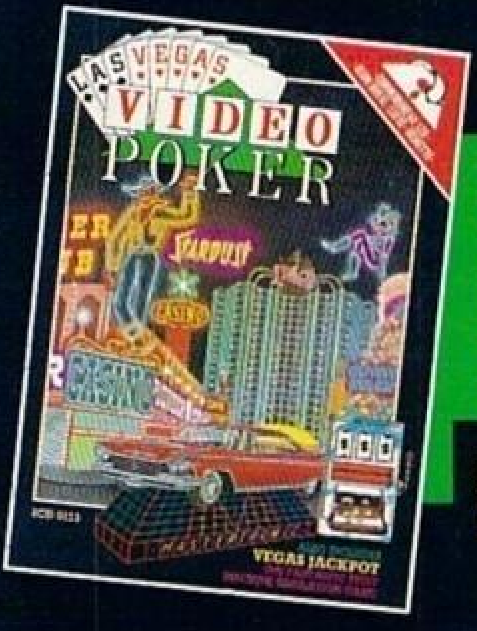
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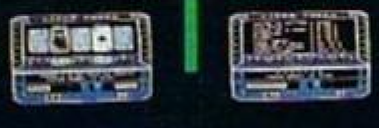

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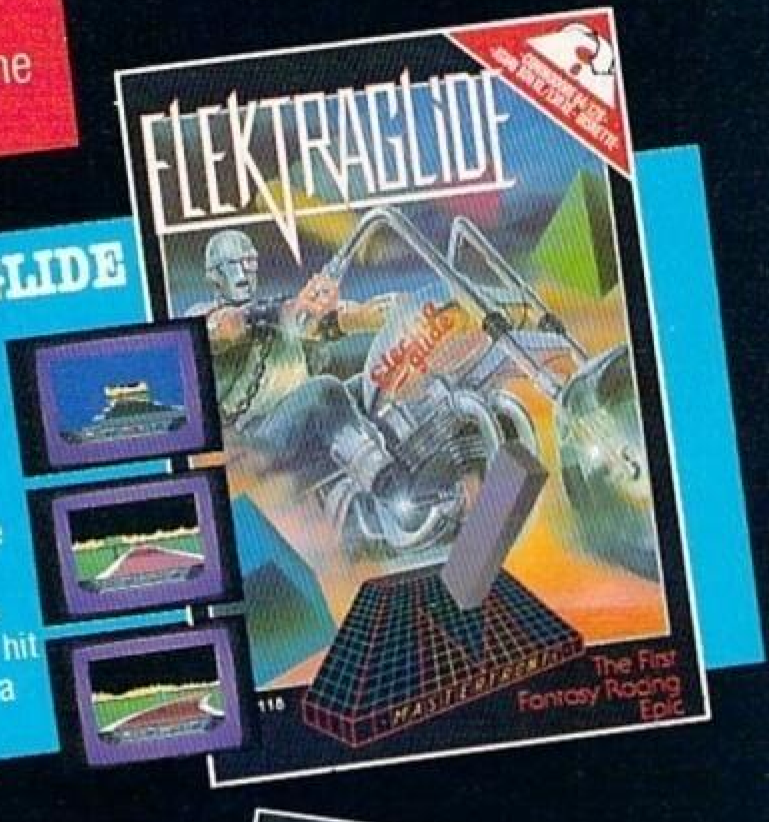
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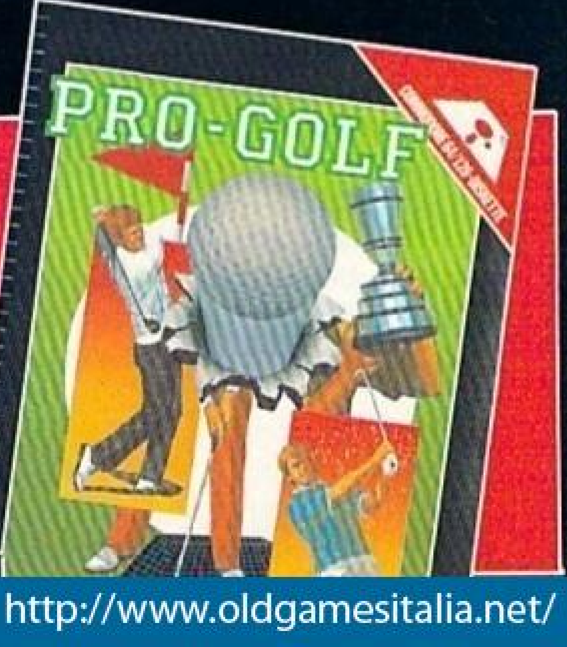
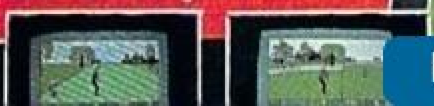


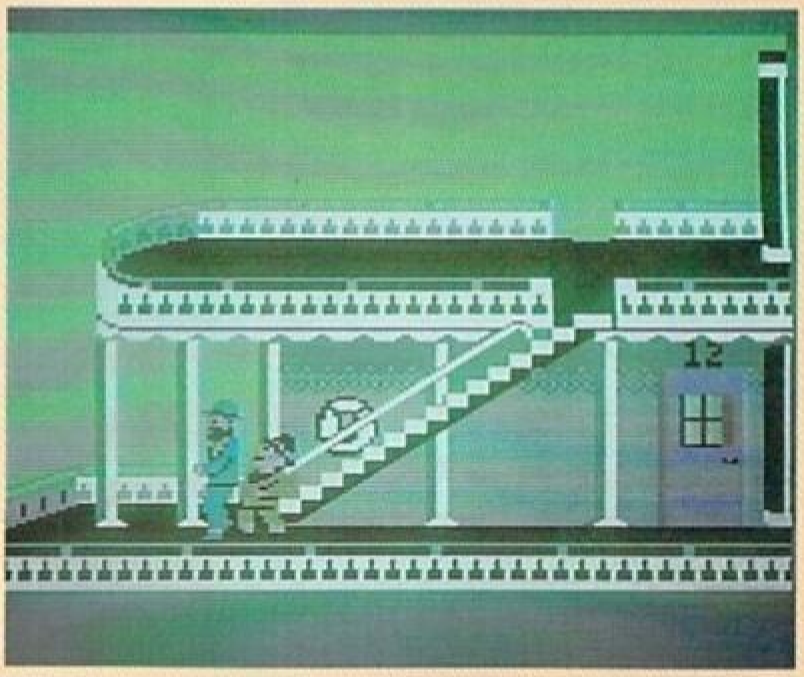


REVIEWED BY RICK TEVERBAUGH

Murder on the Mississippi

Computer: Commodore 64
Publisher: Activision
2350 Bayshore Frontage Road
Mountain View, CA 94043
Medium: Disk
Price: $34.95

You have three days to explore the riverboat's four decks and 24 rooms, and cross-examine eight suspects.



It begins as a quiet ride down the Mississippi River on the Delta Princess paddle boat. As the famous detective Sir Charles Foxworth, you are on your way to New Orleans with your faithful sidekick Regis Phelps. There are seven passengers on board and two crew members. But a leisurely riverboat trip doesn't make for a very exciting game, does it?

So you've got three days to solve a murder. You'll need all the detective skills you've gained through Agatha Christie, Erle Stanley Gardner, Arthur Conan Doyle and Mickey Spillane to figure out this one.

The first step is to find the dead body. Unless you're extremely lucky, you're going to find some live ones before stumbling upon the deceased. Don't waste too much time talking to them until you've found the body.

Once you've found the body, the real fun begins. You can now get down to the nitty gritty. Upon entering a passenger's cabin, you should first ask permission to look around to gather any hard evidence. Regis will come in handy here.

Next, quiz the passenger about what he or she knows about not only the murder victim, but others on board. Each time you get a statement, which may be a single sentence or a long tirade, take notes on-screen. The only catch to on-screen note-taking is that you can take only a single line of notes for each statement, regardless of the length of the original statement. So, choose your words wisely.

The on-screen notes are especially critical because this is the information you take to the other passengers to pry more clues from them. If you're taking the right notes and sharing them with the right people, it will be rewarding. (Don't tell anyone, but it took me about 40 times before I got any additional aid.)

There are four possible endings to the game. One is that you'll run out of time and everyone will get off the boat. The game will be over and the murderer will be gone.

The second possibility is that you'll accuse the wrong person. The third possibility is that you will accuse the right person, but without the proper evidence. In both cases, you'll probably get thrown off the boat and will have to start from scratch. The fourth possibility is that you'll accuse the right person for all the right reasons, which means you win!

There are several clues I can give to help you find the culprit. First of all, be careful what notes you share with other passengers. Don't put much stock in opinions and hearsay. They'll only lead to dead ends. Instead, concentrate on finding out who was near the deceased's cabin and ascertaining a motive and a method.

It is a good idea to also take some notes in a conventional manner—notebook and pencil. This is especially handy if you fail (and you will) to solve the crime the first time around.

Carefully examine the evidence. You may be able to match related pieces together and uncover clues that aren't obvious if you take each piece individually.

At times, it might be necessary to ask a person to follow you from their cabin to another part of the ship. After you're done with them, they might not want to leave. Either they like you or they're just interested in the investigation. If the person is a woman and you can't get rid of her, just go to your cabin. She's not likely to follow.

In the wheelhouse, the captain has a manifest that tells the names, background and cabin number for all the passengers, so make that an early stop. Go back several times to ask questions, share notes and snoop around. You might overlook something the first time, but come up with it the second time around.

The game can be saved at any point, but you can play only one game at a time. If you've got a game saved and somebody else starts from the beginning, the first game will be lost. So don't let anyone play it before you're ready to make an accusation.

As the game begins, you hear water rushing past the sides of the ship. The sound is more prevalent when you wander around the decks. On the lower level, you'll be amazed at the realistic sound of the engine as it chugs along. I found myself early in the game going back to that level under the guise of looking for clues when I really just wanted to hear the engine again.

Movement around the ship and interaction with the passengers and crew is done by joystick. The entire game should be played slow and easy. Even though you'll feel pressure from only having three days to solve the crime, there's always a second, third and fourth time to make the attempt.

The murder victim and the murderer never change. That's an advantage when you run out of time or accuse the wrong person, but it's a disadvantage once you solve the crime.

Murder mystery fans will love this program. It's a challenge that will keep you busy, and it's not likely that you will solve it the first time through. ◼

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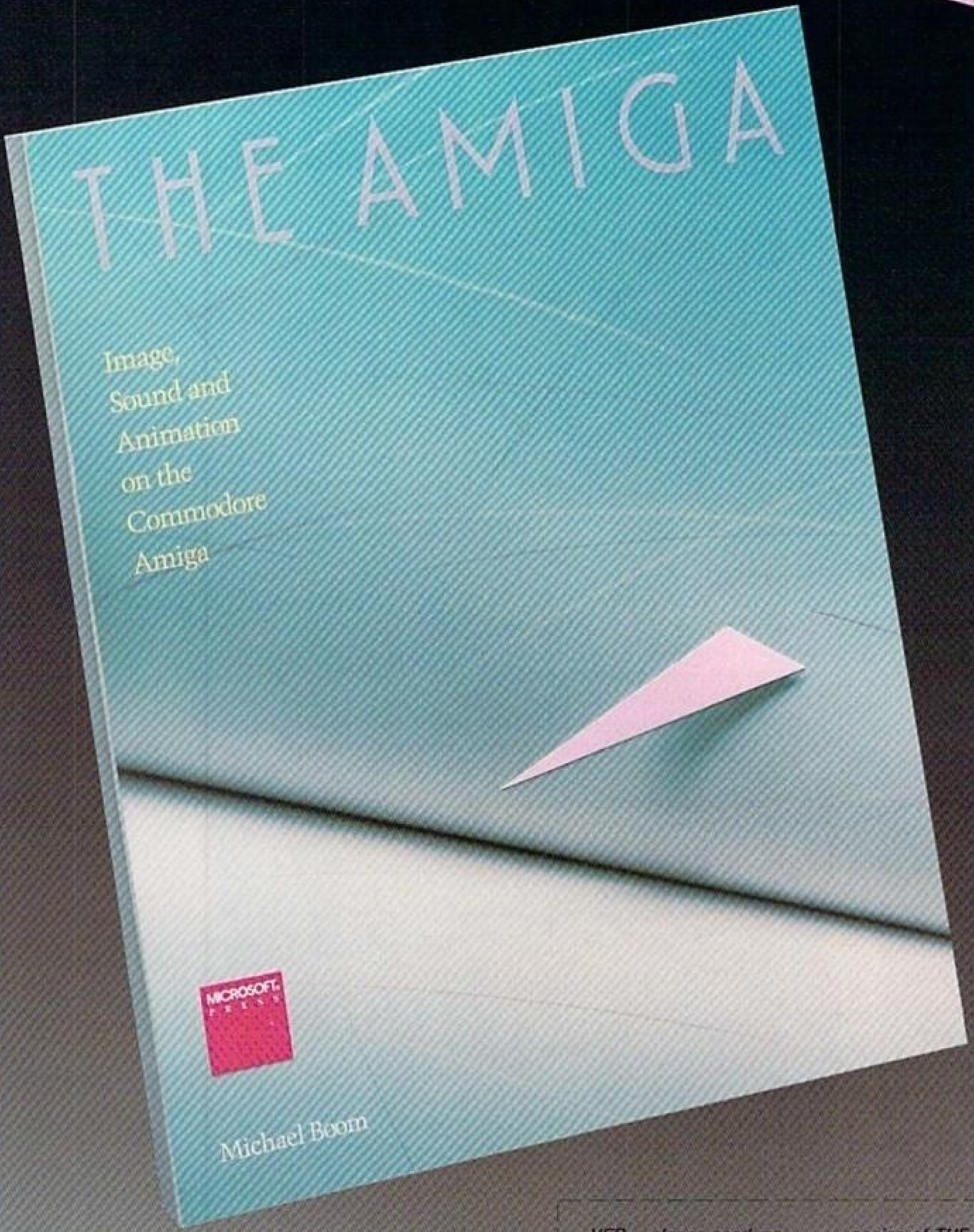

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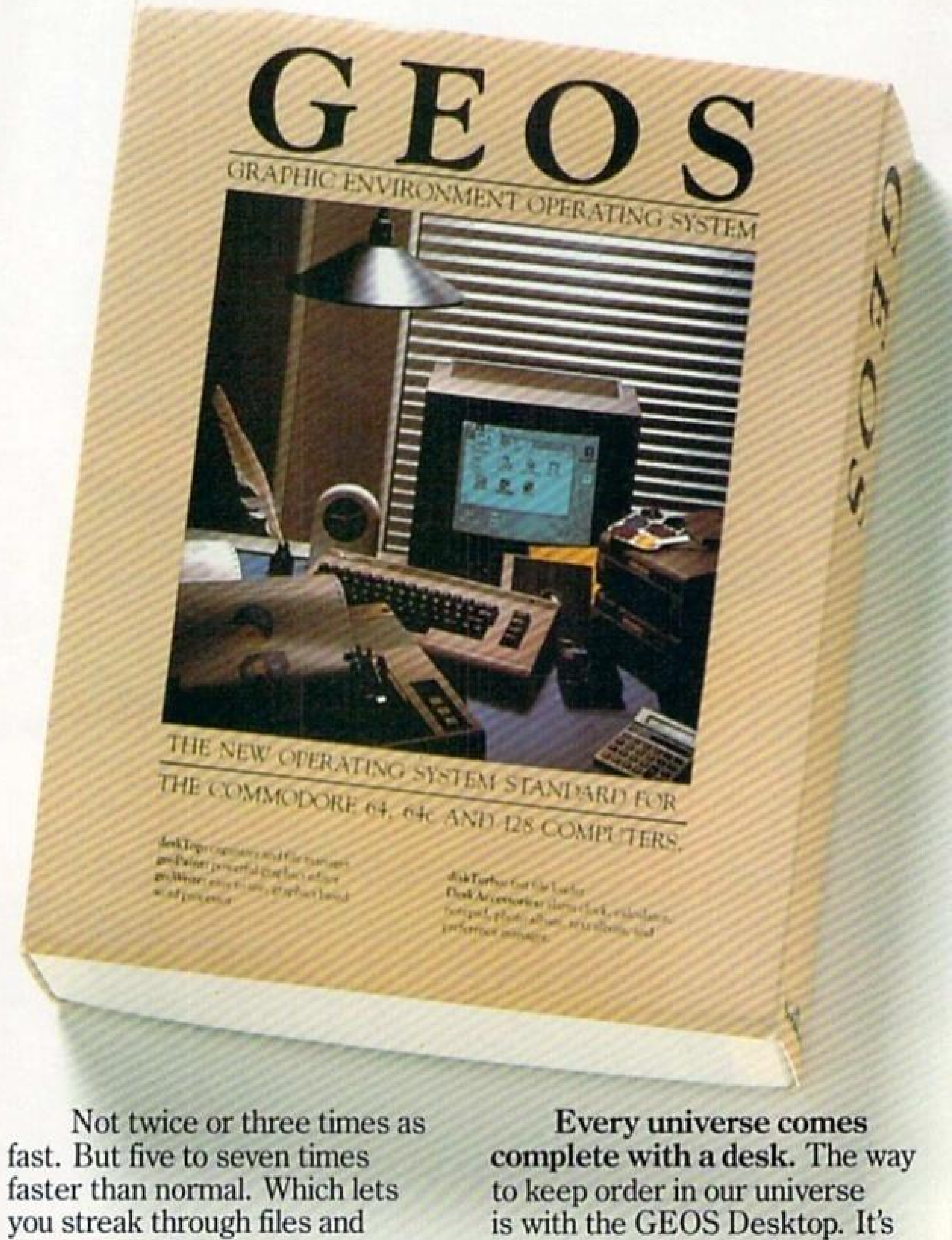
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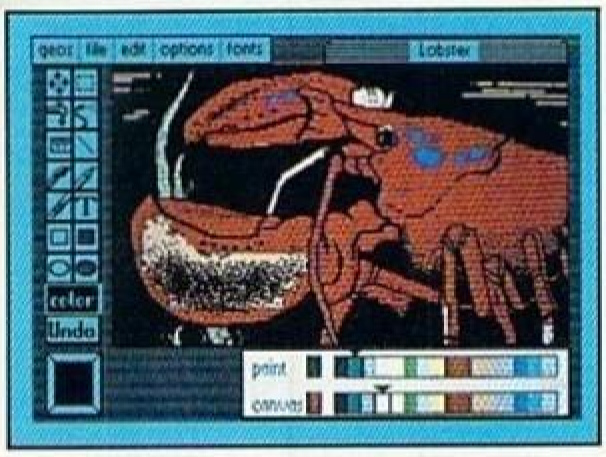
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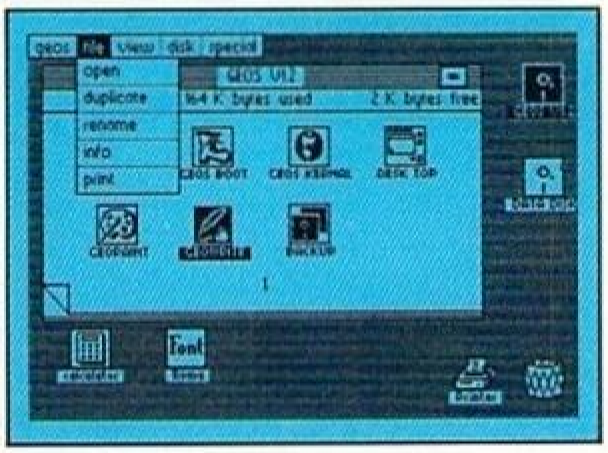
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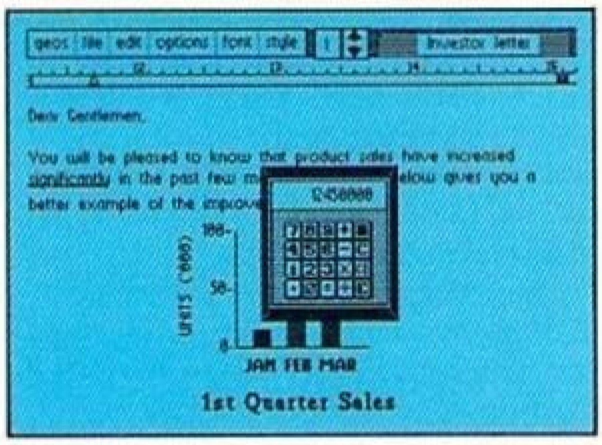
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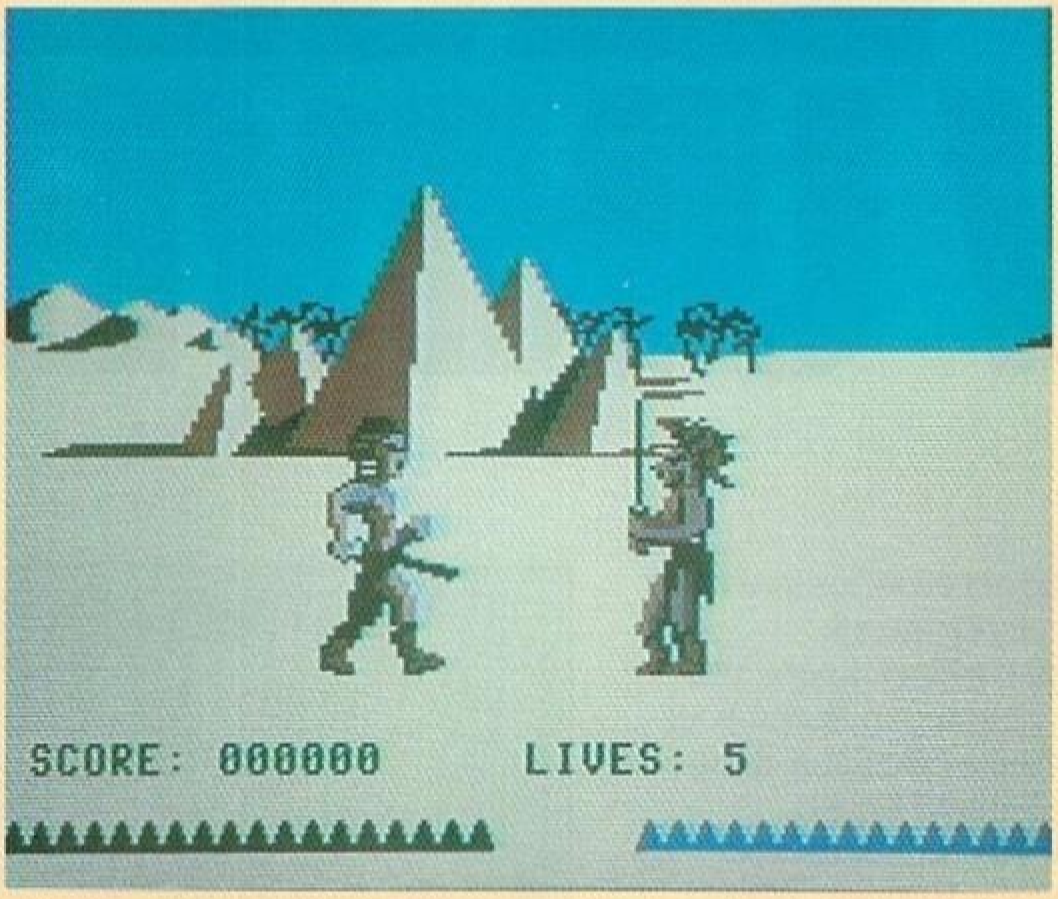
REVIEWED BY MARK COTONE

Kung Fu II: Sticks of Death

Computer: Commodore 64
Publisher: UXB
Spinnaker
One Kendall Square
Cambridge, MA 02139
Medium: Disk
Price: $24.99

In *Kung Fu II: Sticks of Death,* the martial arts' struggle between good and evil continues. Although the flips, fists and kicks delivered by the Dark Master's ninja forces were unable to subdue our karate hero in the original meeting, *Kung Fu: The Way of the Exploding Fist,* the battle is far from over.

The evil antagonists have rekindled the conflict by kidnapping our hero's lovely princess and placing her in a secluded desert prison. To rescue her, our protagonist must once again rely on his well honed skills to pick his way through an entire legion of black magic monsters, a particularly hasty breed conjured into existence with little more than death on their minds. Will the courageous warrior liberate his love from the clutches of evil and go on to inspire another sequel, or will the Dark Master have the last laugh of revenge?



Will the courageous warrior liberate his love from the clutches of evil and go on to inspire another sequel, or will the Dark Master have the last laugh of revenge?

The action is viewed from ground level. With the duned desert as the stage, two combatants approach each other from opposite sides of the screen. You will only have to face one computer-controlled guard at a time, but victory over one will immediately lead to a more difficult match with the next. It's methodical madness.

To add some barbaric seasoning to the competition, the usual hand-to-hand karate combat has been disallowed. Instead, each fighter is furnished with a Stick of Death, a harmless looking implement which proves lethal when wielded by a skilled attacker. Although the weapon's name might seem unfamiliar, anyone who has ever seen a Kung Fu flick will remember it well. They're those wooden batons, about the size of a yardstick, that are deftly twirled and swung about in a blur of motion. The idea is to use the stick to whack your adversary in a tender body area while still keeping yourself out of harm's way.

Using joystick or keyboard, you choreograph the hero's on-screen attacks. He's a mobile combatant, not only prepared to swiftly advance and retreat, but also agile enough to jump and duck on command. The Death Stick can be employed for three different offensive thrusts: either to clobber the head, stab the midsection, or slash the ankles. Needless to say, it can be rather punishing to be on the receiving end of any one of those moves. Every hit takes its toll. Each player's initial life energy, and the inevitable loss of it, is measured and monitored at the bottom edge of the screen.

If your surrogate is the first to lose all of his power, he will fold and crumble to the sand, expending one of his five lives. A new warrior with a full allotment of energy will then replace him, and the match will resume. When a monster is sapped of strength, he also falls dead, but then transforms into a Grecian Urn. These ornate vases are your tickets to the princess.

Use your staff to destroy the urn within an allotted amount of time and it will either open a secret passageway that moves you closer to the prison or will present you with a new, more powerful foe. It's a risky swing of the stick, but it's the only chance you have to move toward your ultimate goal. An urn left unscathed will only reincarnate the same mutant you previously slayed.

As an arcade contest, *Kung Fu II* has some well designed, winning elements. The graphics are crisp and colorful, presenting detailed desert backdrops that scroll as the participants vie for position in the foreground. Your enemies take on all sorts of demonic creature features, with winged dragons, horned gargoyles and crazed hounds each challenging you with their own particular look, style and attack strategy. With the number and variety of aggressors presented, the game develops into more than a series of bouts where one can simply trade blow for blow.

Instead, one must approach each trial as a sort of fencing match, carefully studying the enemy to find a weakness,

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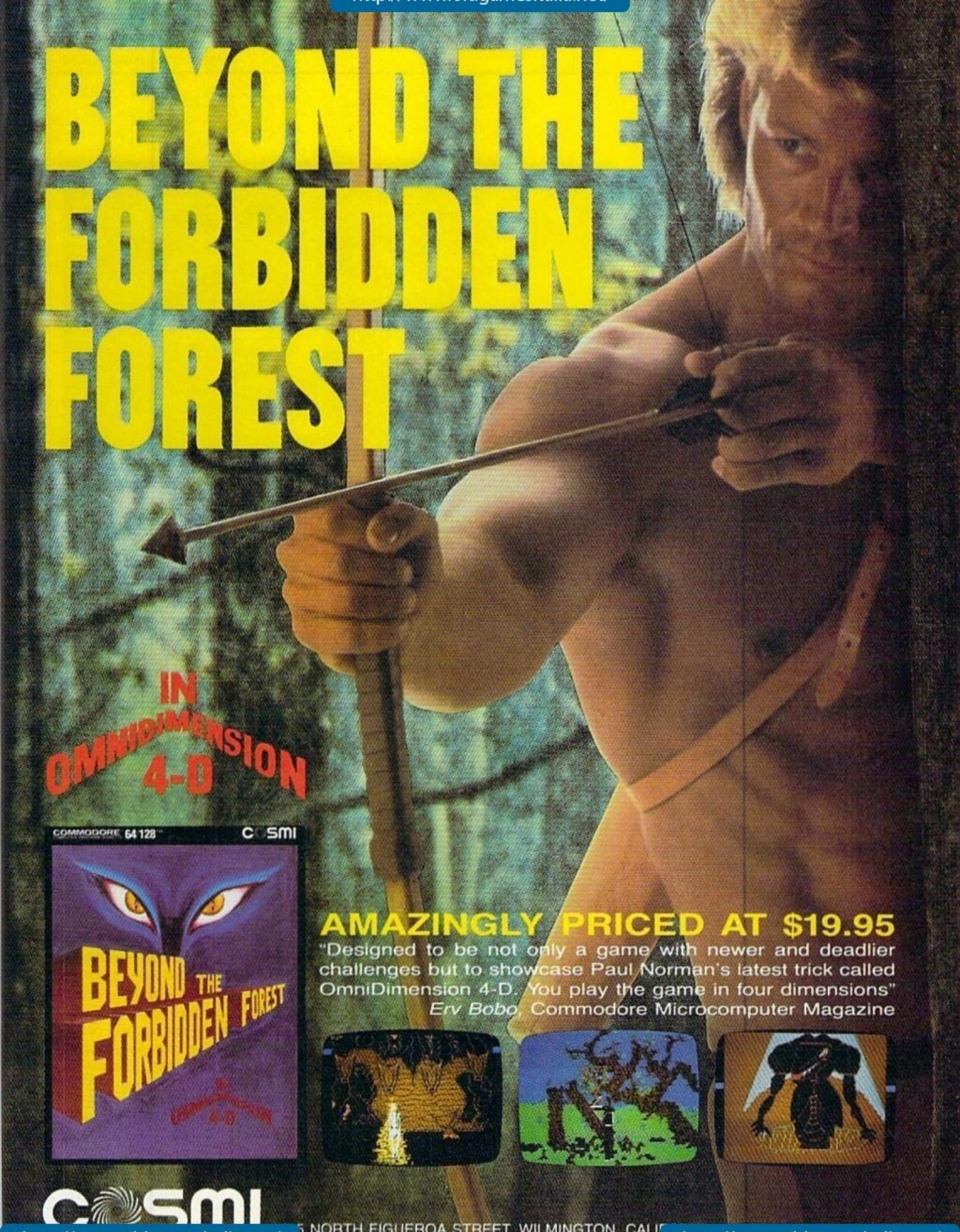
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"Designed to be not only a game with newer and deadlier challenges but to showcase Paul Norman's latest trick called OmniDimension 4-D. You play the game in four dimensions"
Erv Bobo, Commodore Microcomputer Magazine

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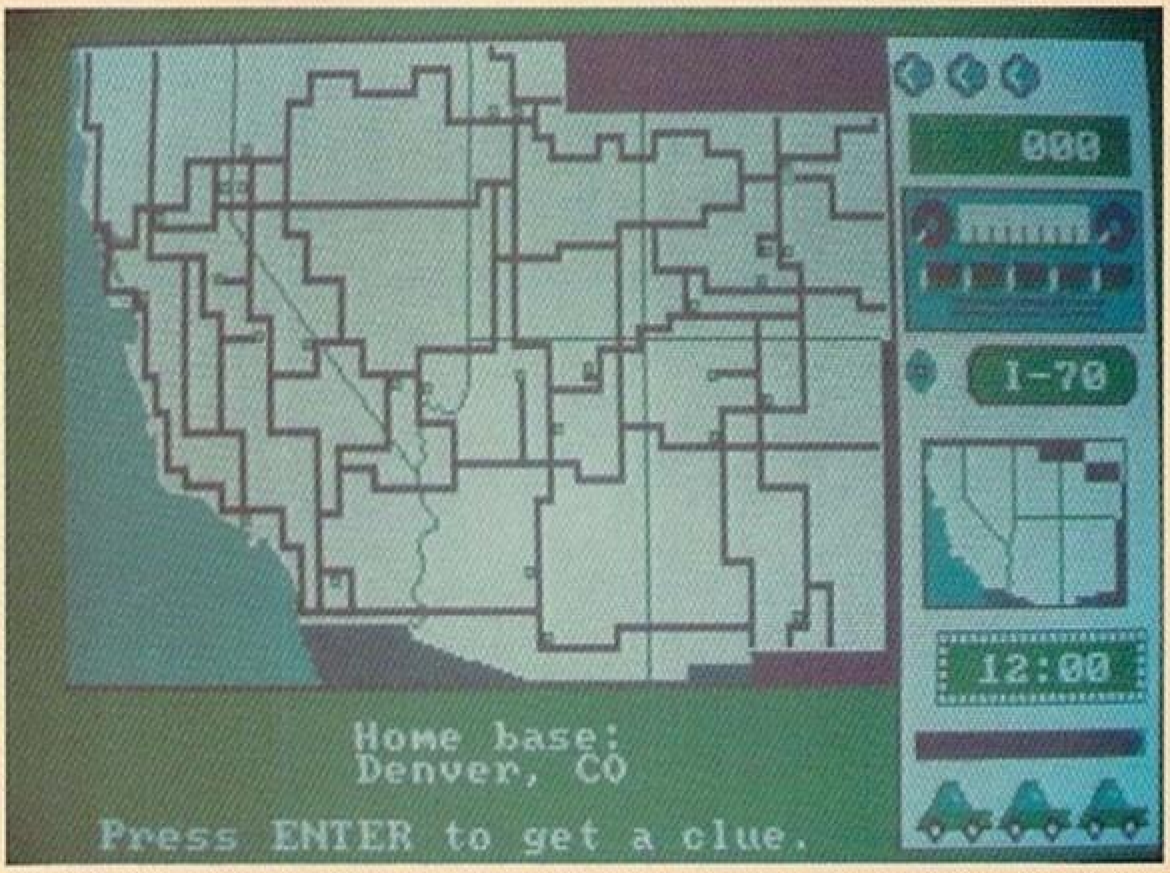
REVIEWED BY MARK COTONE

Road Rally U.S.A.

Computer: Commodore 64
Publisher: Bantam Software
666 Fifth Avenue
New York, NY 10103
Medium: Disk
Price: $29.95



Home base:
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Road Rally U.S.A. *puts your piloting and map-reading skills to the video road test.*

Bantam's *Road Rally U.S.A.* is an educational challenge that puts your piloting and map-reading skills to the video road test.

Your play field is a United States that is broken into seven regions: New England, Middle Atlantic, Southeast, South Central, Southwest, Northwest and North Central. To enter the race, you choose which region you would like to explore, and you are granted a set of wheels, a full tank of gas, a home base, and a destination landmark.

The object of the game is to use efficient routine and safe driving skills to arrive at your goal city in the shortest time. Two types of maps are used throughout the race. When you first choose a region, a large map offering an overview of the entire area is displayed, showing state-to-state relationships along with the positioning and length of their major asphalt arteries. A more precise map is accessed when the actual driving gets underway. Sites, stations, monuments and other roadside attractions are colorfully depicted from an overhead perspective.

Driving your computer car is much the same as operating the real thing. Your accelerator, steering wheel and brake pedal are all keyboard activated, a control choice that may leave some joystick veterans alienated, but which proves functional and responsive nonetheless. I only suggest that inexperienced typists become familiar with the few key positions used before trying to hit the pavement. Believe me, once you're off and running, you won't want to glance down to reposition your fingers.

Aside from trying to untangle the network of roadways, one must also be on constant alert for such unexpected curbside occurrences as falling trees, misguided snow plows and deadly hail storms. An accident of any magnitude will incapacitate your car, depleting one from your fleet of three. So it's best to keep your eyes on the road.

Fortunately, *Road Rally U.S.A.* has incorporated enough travel support to help keep you on schedule and out of trouble. An on-screen dashboard will prove invaluable, providing a panel full of informative gauges to keep you pointed in the right direction. In addition, there's the Road Indicator, which constantly monitors and displays the name of the highway you're traveling; the Section Locator, which pinpoints your current location radar-style; and the fabulous Flashing Radio, which strobes to warn you of any nearby hazards.

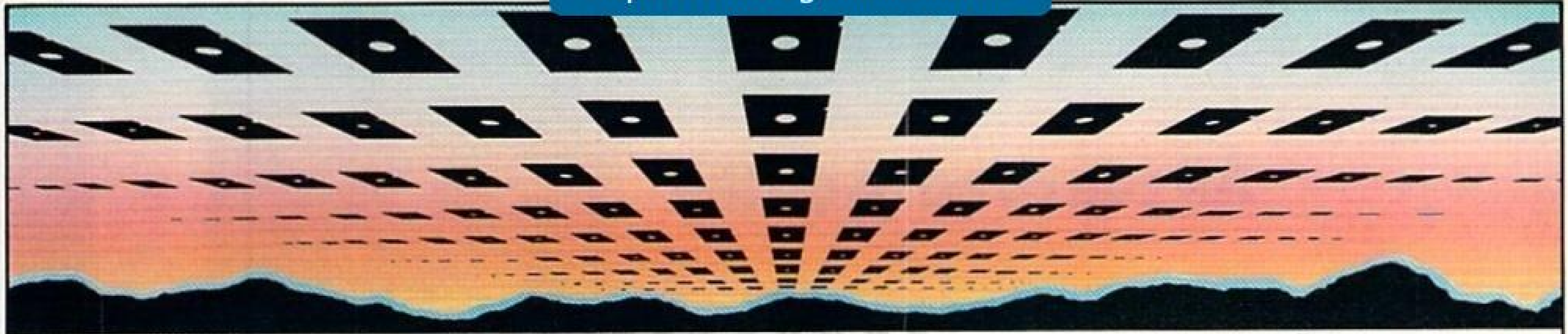
A little off-screen assistance comes in the form of some handy map cards: seven cards that recreate the regional maps, while providing an enlightening rundown of each area's states, cities, resources, and national, recreational and historic landmarks. These are an important part of game play, often helping the driver locate an obscure destination. The game also comes packaged with a full-size *Road Rally U.S.A.* poster, a colorful piece of artwork which highlights locations that can be visited during play.

The controls have been kept simple and logical, and a reference card outlines the key functions. After a few thousand miles of playing time have been logged, the contest is kept fresh by changing goal destinations with different route possibilities, in addition to the three skill levels. At the hardest level, the driver must visit five locations in 12 minutes, with target sites only given in the form of obscure clues.

It's a formidable challenge, and unless you're already a certified geographic whiz who knows the location of our nation's deepest canyon or the whereabouts of its oldest city, then a bit of stimulating research and learning is in order.

This computerized coast-to-coast educational tour takes players crisscrossing around our country to explore and discover the location and significance of actual U.S. landmarks, teaching geography, map-reading and problem solving along the way. *Road Rally U.S.A.* is captivating fun for student drivers of all ages.

Continued on pg. 127



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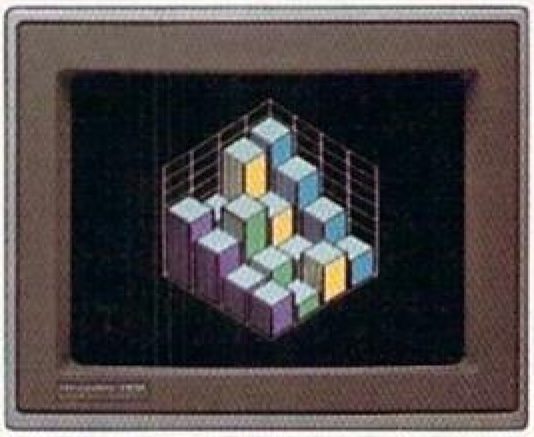

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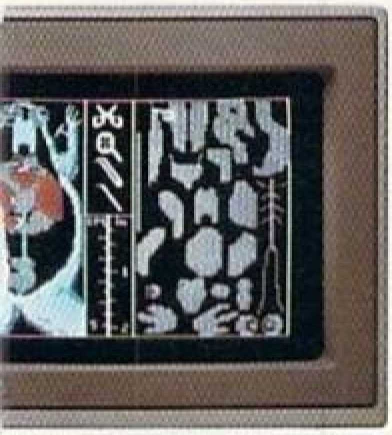

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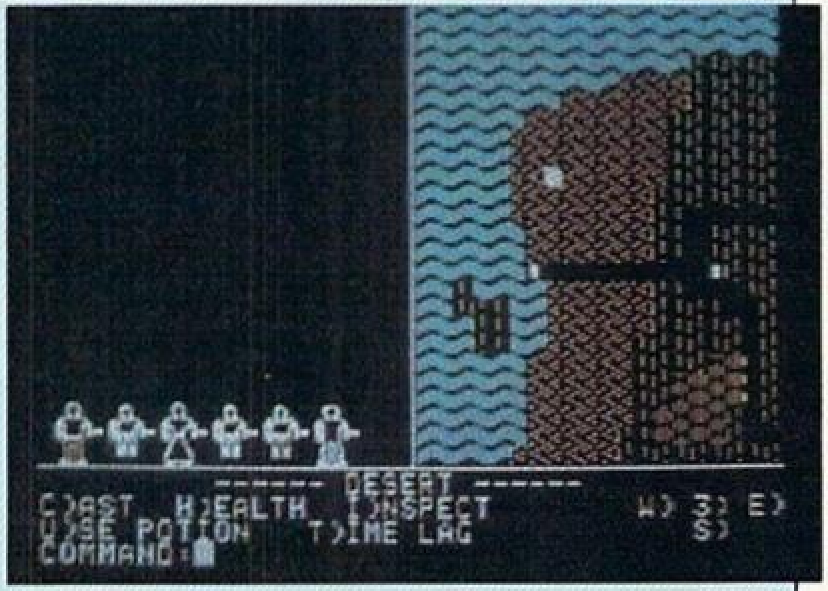
REVIEWED BY SCOTT A. MAY

Phantasie II

Computer: Commodore 64
Publisher: Strategic Simulations
1046 North Rengstorff
Avenue
Mountain View, CA 94043
Medium: Disk
Price: $39.95

Phantasie II allows users to transfer characters from the original to the new game, and vice versa.



One of the best additions to the fantasy genre was Strategic Simulations' *Phantasie*. This one-player game quickly became a best seller because of its depth of play, multiple character development and menu-driven joystick control. *Phantasie* was a game players could really sink their teeth into.

Players who made it to the end of *Phantasie* may think that their quest is over. Hardly. Polish up your broadswords and get plenty of rest, because *Phantasie II* has arrived.

Strategic Simulations and designer Doug Wood wisely chose not to mess with a good thing. *Phantasie II* has added attractions, but for the most part, the game's structure, rules and player controls remain intact. In fact, the instruction manual for both games is identical. A small card packaged with *Phantasie II* describes the new quest and the added features.

Borrowing from other role-playing adventures, *Phantasie II* allows users to transfer characters from the original to the new game, and vice versa. This is especially nice considering that one of the toughest challenges is building up your group's strength. A small price must be paid for this journey, however. Characters lose all their combat items and most of their accumulated wealth, experience points and magic spells. Fortunately, a quick visit to the Adventurers' Guild restores each character to an acceptable level. I especially appreciate having familiar faces around when facing danger.

The story begins 40 years after a group of brave adventurers has saved the Island of Gelnor from the rule of the evil sorcerer Nikademus. Since that time, Ferronrah, which lies south of Gelnor, has been isolated by a mysterious cloud that hovers over the island. No one has left or entered the island since the cloud first appeared.

Rumors persist that Nikademus has enslaved the population of Ferronrah with the help of a mysterious orb. One thing is certain, though, when Nikademus gathers enough strength, he will attempt to spread misery and death throughout all lands. Your task is to guide up to six fearless adventurers across Ferronrah to destroy the evil orb. Your travels take you through dark wilderness regions, mysterious dungeons, the Astral Plane, and two levels of the Netherworld. It is a quest you dare not fail.

Phantasie II's first enhancement is the actual size of the fantasy world. The island of Gelnor in the original game contained 16 regions, whereas Ferronrah offers 28. There are also new terrain features that present greater dangers. In some regions, characters must hot-foot it over beds of molten lava to reach their goal. Only the strongest adventurers will survive. Other features include Dark Voids and areas shrouded in a deadly mist, where the not-quite-dead roam in search of lost travellers.

What sets *Phantasie II* apart from most fantasy role-playing games is the quality of its character development. Creating a unified team from a group of mixed characters is hard work. Just as a chain is only as strong as its weakest link, the members of your team must learn to support each other at all times. *Phantasie II* is not a game of individual triumphs. Its brilliance is based on the concept of common bond and mutual survival.

Phantasie II can also be very emotional. When you finally achieve a solid bank of fighters, wizards, monks and thieves, these characters become so real that the thought of losing one can be devastating. If a character dies, his soul departs for the Astral Plane, where final judgment is made. I won't give away any secrets, but the results of this judgment can be very interesting. If you never thought you could become attached to an ogre or lizardman, you've never played *Phantasie II*.

Character development is meaningless if members of your team end up dying each time you wander out into the countryside. A good strategy for beginning players is to stick close to a town or an inn in case of an emergency. In the early stages of the game, learn the art of hit-and-run. Engage in small battles and don't be too proud to beg for mercy if the odds turn against you. Soon you will be able to venture further from the safety of a town, where you will begin to meet truly nasty creatures. Remember, the tougher the battle, the bigger the reward.

Exploring dungeons is one of the most dangerous aspects of *Phantasie II*. Dungeons are often laden with traps, puzzles and armies of particularly nasty creatures. One of the biggest mistakes made by novice adventures is to wander too far inside the twisting tunnels. After you lose valuable hit points, the exit door tends to look a million miles away.

The rules you follow on land are twice as important inside dungeons. Take your time. Print out all scrolls and write down every word you read while in the dungeons. Key words at the beginning of the game may pop up much later. Even if it appears to be nonsense, write it down.

Phantasie II is an inspiring trip into another world. This world is only an illusion, but it has substance and meaning for all who enter. Opening new doors to the imagination, *Phantasie II* is a classic. C

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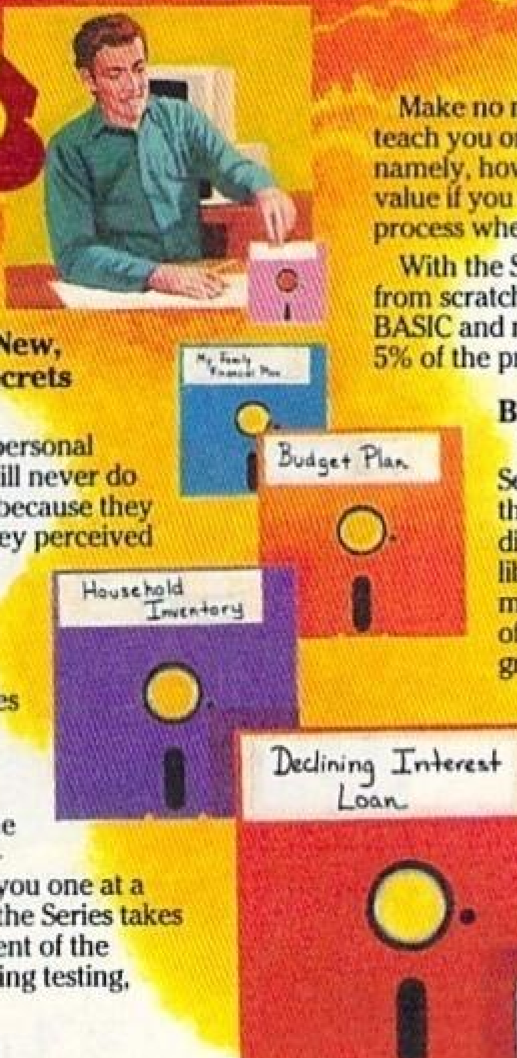

From Writing Your Own Programs to Modifying Existing Software, Here's the New, Easy, and Low Cost Way to Unlock the Secrets of Your Computer

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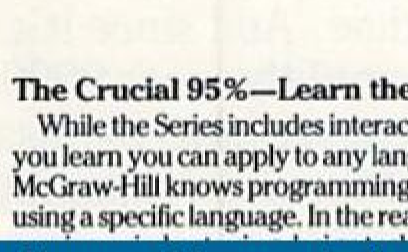

Now comes the fun part. You'll discover how this program is built, and in the process you'll learn how to identify and correct errors. And by the end of Module 1, you'll actually have completed this program yourself.

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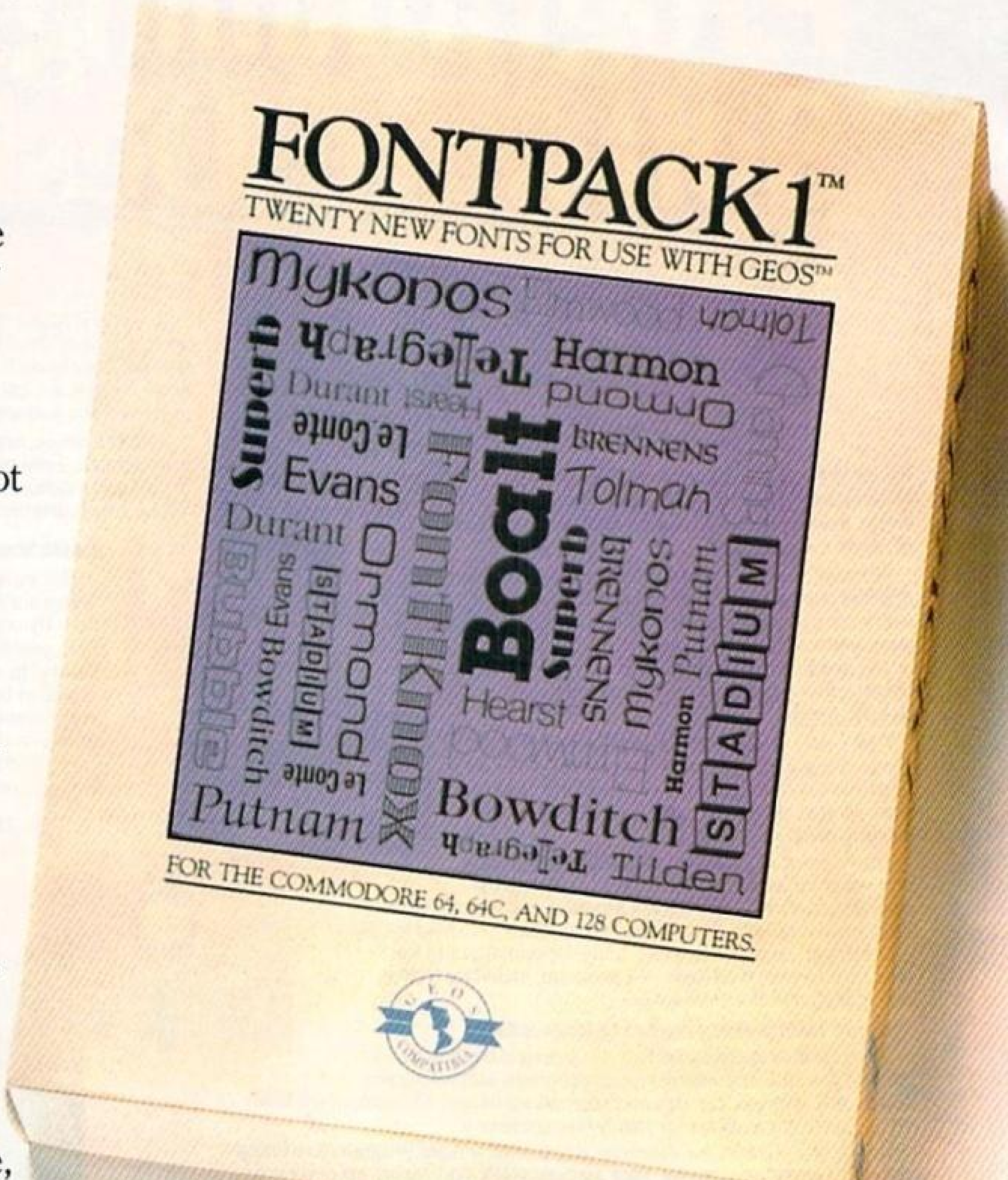
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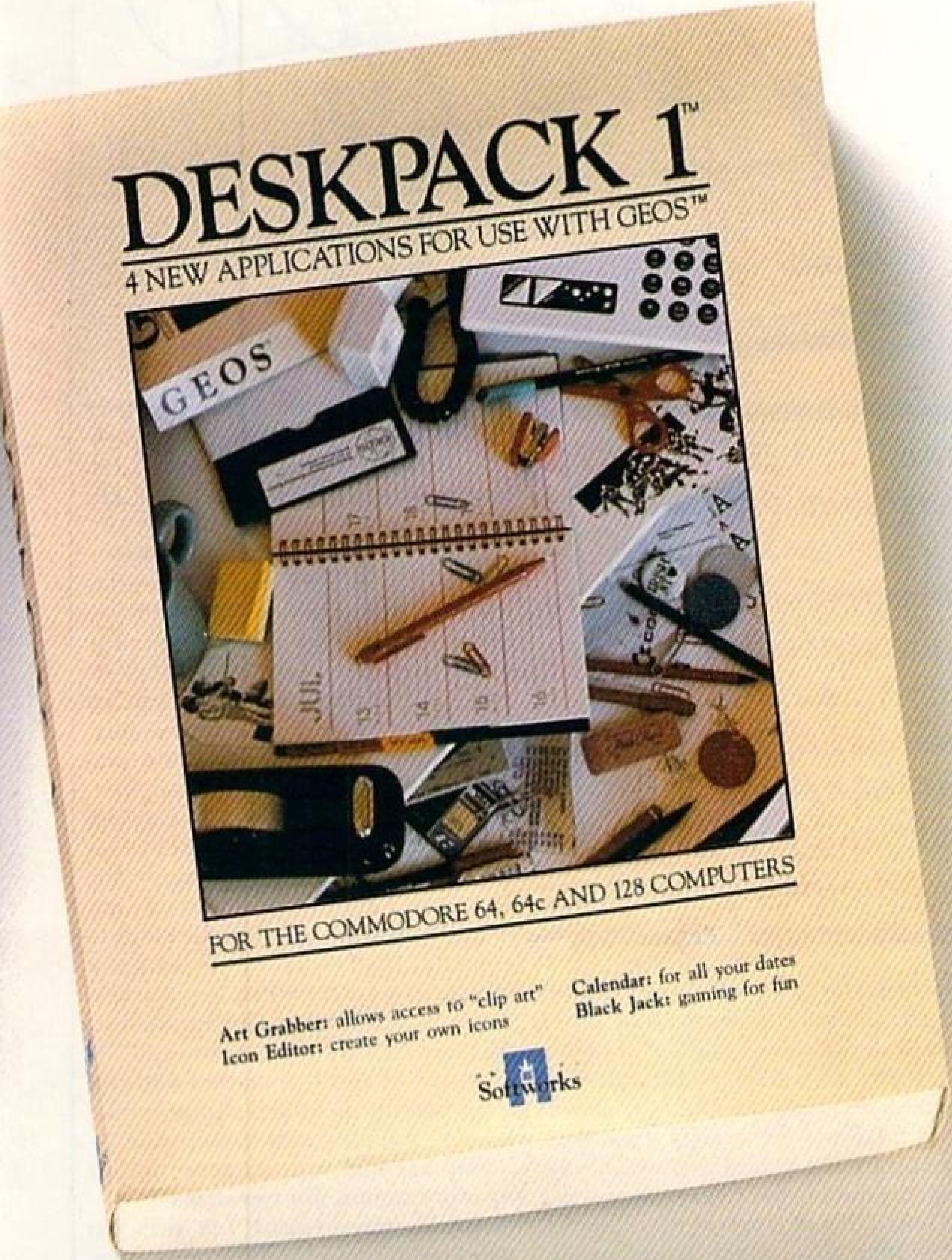
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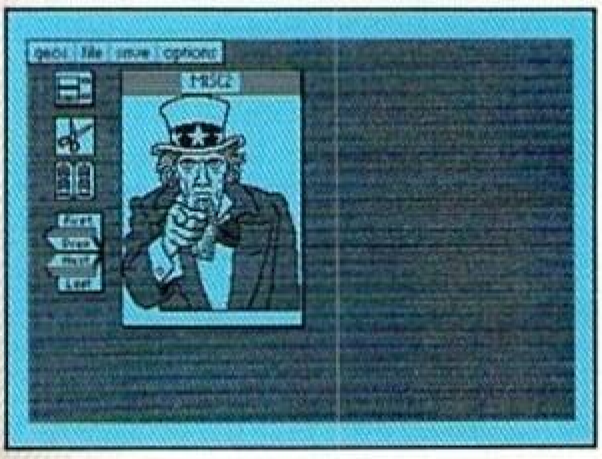
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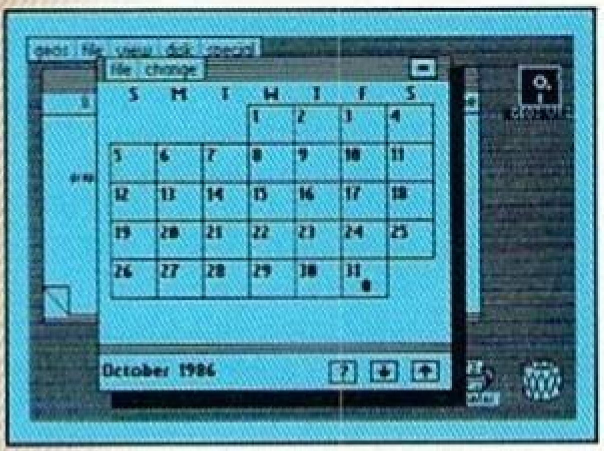
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October 1986

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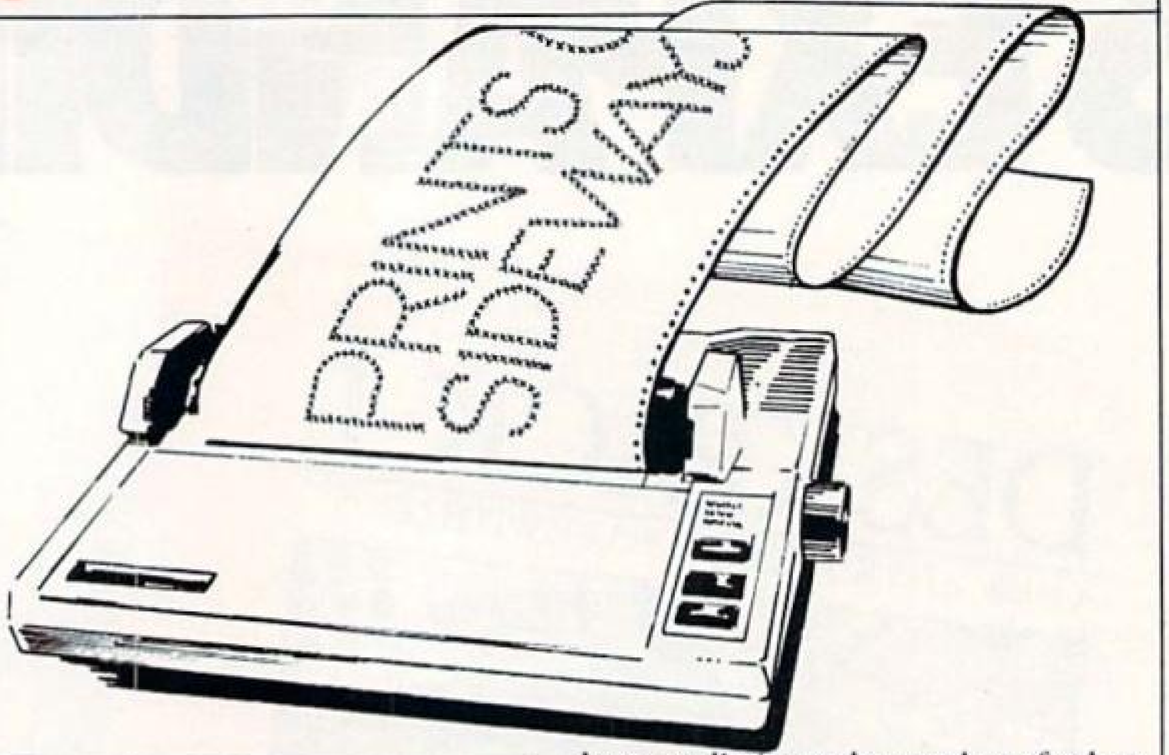
REVIEWED BY BOB GUERRA

Swiftcalc 128



Computer: Commodore 128
Publisher: Timeworks
444 Lake Cook Road
Deerfield, IL 60015
Medium: Disk
Price: $69.95

Swiftcalc 128 was not only one of the first programs to make the transition from the Commodore 64 to the 128, but its sheer calculating ability and the tremendous flexibility with which it allowed users to create and modify spreadsheets also made it one of the most powerful. At the same time, convenient pull-down menus, help screens, and a superb user's manual made it surprisingly easy to use.

Since then, a number of spreadsheet programs have been released that take advantage of the 128's advanced features, but none has come as close to unleashing the computer's full potential as *Swiftcalc 128*. Even so, Timeworks has decided to pull further ahead with its release of a significantly updated version of *Swiftcalc 128*.

This latest version includes all of the features offered in previous versions, plus a few. The first is the ability to sort up to three rows or columns of labels alphabetically in either ascending or descending order. As a column of names is sorted, for example, data in the corresponding rows is also rearranged to match up with your newly alphabetized list, giving the program simple data base capability.

Another improvement is an 80-column version of *Sideways* that works in 128 mode. *Sideways* is a program that prints large spreadsheets with a standard dot-matrix printer by rotating the print 90 degrees. Although the previous version of *Swiftcalc 128* included *Sideways*, it could only be used in the 64 mode.

Perhaps the most significant improvement to *Swiftcalc 128*, however, is the addition of a graphics menu. With it you can display numerical data on-screen using six different types of graphs, and create hard copies of your graphs using a dot-matrix printer.

One type of graphic you can create is a vertical bar chart to represent different values with bars of varying lengths. A similar, though slightly more complex graphic which is available through the graphics menu, is the three-dimensional bar chart. This chart, which allows you to directly compare more than one set of data, is displayed as a number of similar bar charts stacked one behind another. Because it displays data in three dimensions, it has not only a vertical and horizontal axis, but a third axis which runs from the front of the chart to the back.

> Swiftcalc 128's *updated version now includes the ability to sort up to three rows or columns of labels alphabetically in either ascending or descending order; an 80-column version of* Sideways, *and graphics capabilities.*

Other types of charts at your disposal are scatter plots, which represent numerical values as points or dots on a graph; line plots, which are like scatter plots that someone has used to play connect-the-dots; pie charts, which represent percentages of a whole as different sized slices of a round pie; and exploded pie charts, which are really the same as pie charts except that the slices don't quite touch.

Although the ability to display and print out these graphics can help you visualize trends and analyze numerical information, you should remember that there are limits to the number of values which can be represented. The three-dimensional bar chart, for example, can only be used to represent a block of cells that is a maximum of four rows deep by six columns across for a total of 24 values.

These are some of the enhancements that have been made on an already excellent program. For those of you unfamiliar with the original *Swiftcalc 128*, you should know that it is a full-featured spreadsheet program that can be interfaced with two other Timeworks programs, *Word Writer 128* and *Data Manager 128*. It allows you to create spreadsheets of up to 250 columns by 250 rows for a total of 62,500 cells or places that you can use for labels, numbers, or formulas. As you set up your spreadsheets, common labels such as the names of months, days of the week, or sequential numbers can be filled in automatically by the program. Furthermore, rows and columns can be added or deleted with ease and when you do make a change, formulas that you've already entered are instantly updated with reference to any rows or columns that were named.

Another way *Swiftcalc 128* saves you time is with relative copying of formulas. Let's say, for example, that you need totals for several columns of numbers. Instead of entering SUM a1:a9 at the bottom of the first column, SUM b1:b9 for the second and so on down the line, this feature allows you to enter the formula once and then quickly copy it as many times as needed while automatically updating the formula to fit the new locations.

The formulas you use in your spreadsheets can be up to 240 characters long

Continued on pg. 124

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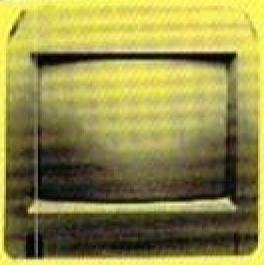

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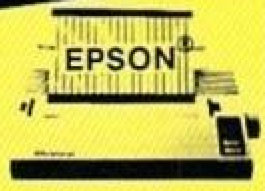

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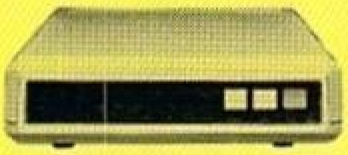

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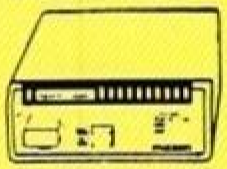

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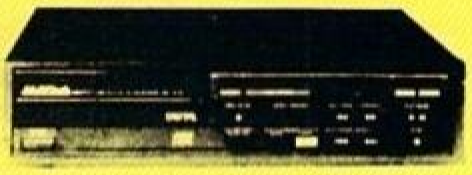

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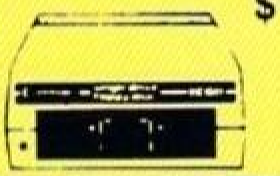

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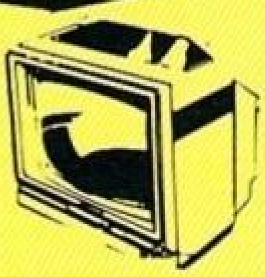

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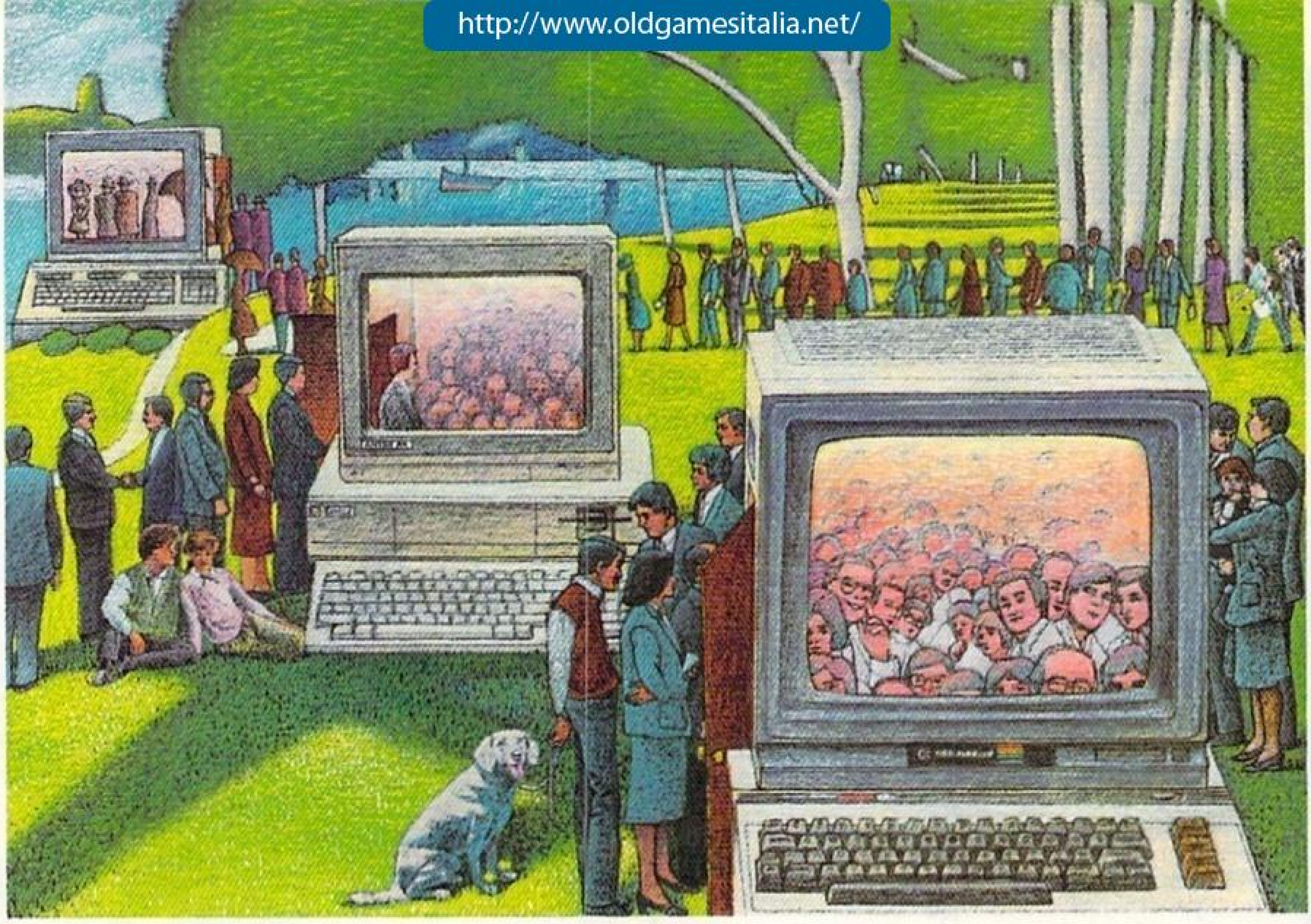

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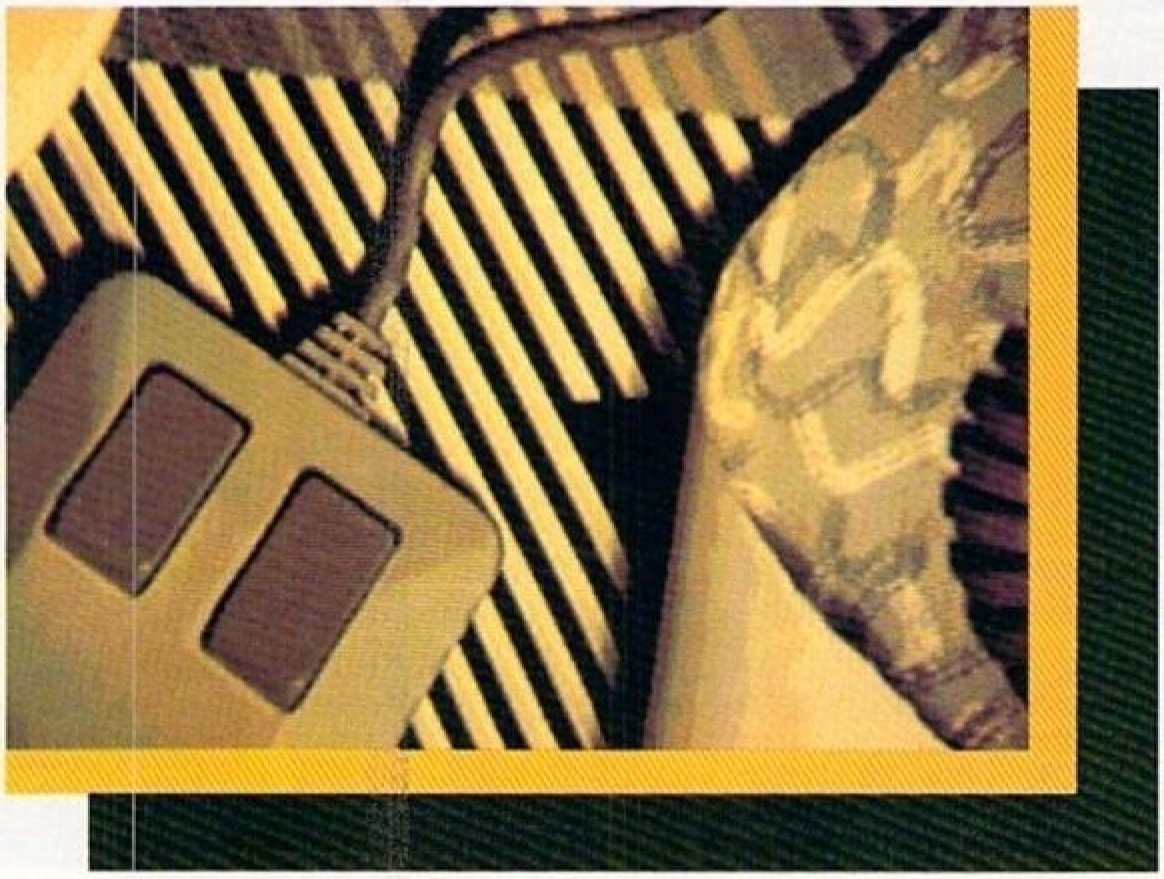

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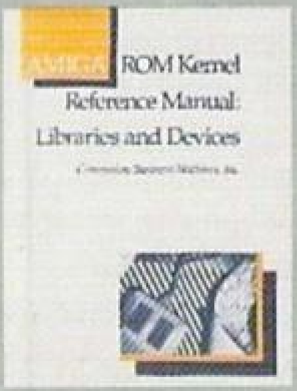
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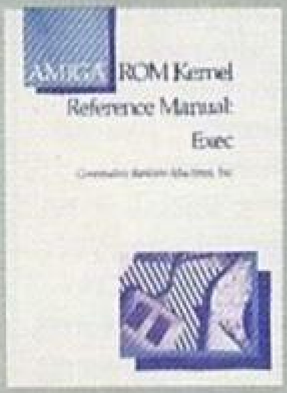
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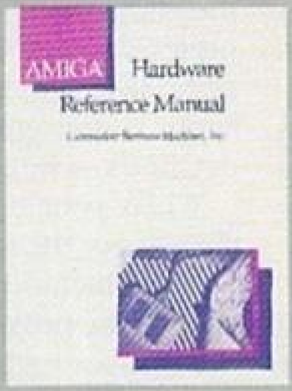
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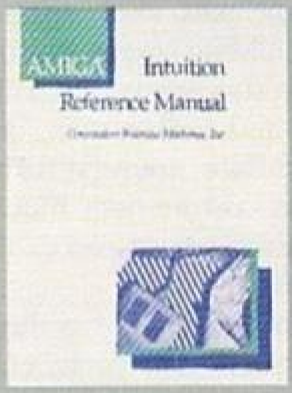
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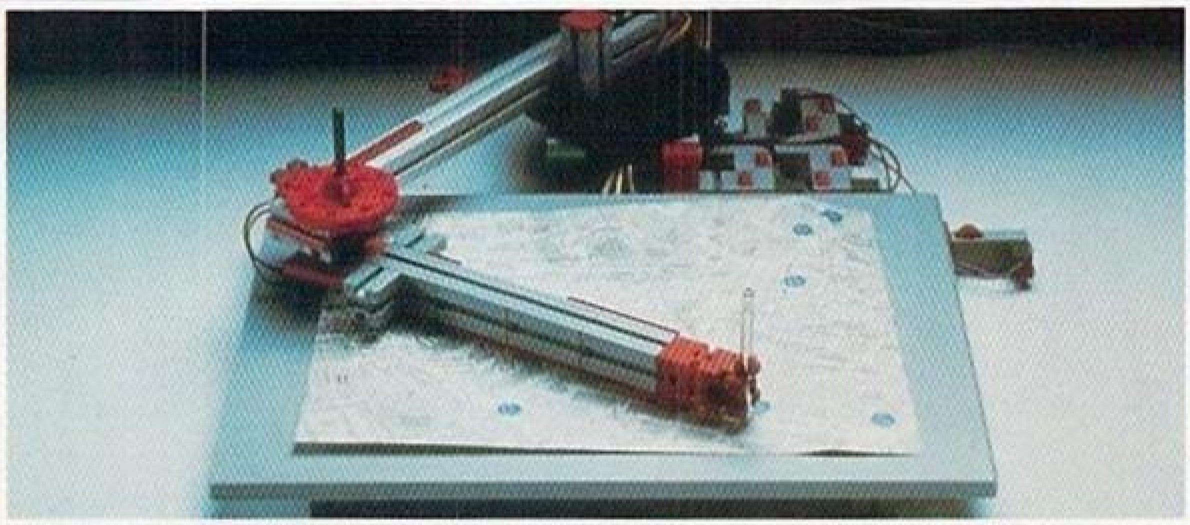
fischertechnik Robotic Computing Kit



Computer: VIC 20, Commodore 64/128
Manufacturer: Fischer America
175 Route 46W
Fairfield, NJ 07006
Price: $199

Those cranes, draw bridges and ferris wheels we built when we were young no longer make it. It's time we take our nuts, bolts and steel girders and graciously step aside. With the fischertechnik Robotic Computing Kit linked to your VIC 20, Commodore 64 or Commodore 128, you can now construct complex projects like aerial rotors, traffic signals, and solar tracking systems. Not only do they look impressive, but they also teach programming, electronics, physics and robotics. What a fascinating introduction to the world of computer-controlled devices.

It's not hard to guess how this kit developed. In the past, Fischer has made a business of building large robotic models for such powerhouses as IBM, Ford, General Motors and Volkswagen, designing them to simulate manufacturing processes. These custom-built models may consist of thousands of pieces and take months to build.

The fischertechnik set has three components: construction parts, computer interface, and program disk. Each shows an attention to detail that is sure to be appreciated by users of every age and level of expertise.

Anyone who has ever connected LEGO™ bricks possesses all the manual dexterity needed to use this kit. The same "snap" technique is used here. Using the plastic and metal components provided—everything from clips, switches and wires to the more elaborate potentiometers, electromagnets and photoresistors—virtually any electromechanical system can be structured with ease.

Even if you have no knowledge of robotics, programming or electronics, you won't have any problems. The guidebook outlines ten pre-designed devices of increasing sophistication, using pictures to detail each step of construction. This helps ease you into the overall construction process, orientating you to the specific position and function of each part.

With suggested projects like the Material Lift, a moving elevator that handles priority and stored calls, and the Teachable Robotic Arm, which can be programmed to perform a wide variety of tasks, it's evident that fischertechnik tried to capture real life counterparts. These are not mere look-alikes, but complex recreations.

Once a device is erected, it is brought to life with the aid of a computer interface. This box connects to the modem port of your computer, providing the necessary input/output pathways needed to carry signals and information between the computer and operating parts. It furnishes channels for two potentiometers, eight switches, and up to four motors, lamps and magnets. An interface manual details the wiring of the hardware.

When your computer is linked, it is time to put the mechanism into motion. The disk included with the package contains all the programs needed to activate and operate each project. By witnessing physical movement instead of simply watching images on-screen, you get to see a tangible link between your program and the movements of your construction set components.

It's a unique learning experience. And once you become comfortable with the foundation of operations, a BASIC driver lets you experiment with changes in the documented projects, or create original devices of your own! And the components from the Computing Kit can be used with all fischertechic kits.

The fischertechnik Robotic Computing Kit was created to be a fun way for youngsters to learn about programming and engineering. It's an unrivaled innovative educational tool whose entertainment value rates as high as any computer game.

But this product's potential goes far beyond the realm of a plaything. With a host of additional construction parts available, the kit is a creative catalyst whose scope grows right along with your increased understanding of robotics. There has never been anything quite like it.

Ed. Note: Since this article was written, two new projects have been added: Three-Axis Training Robot and Plotter Scanner. Neither works with the VIC 20.

Projects Included in Kit

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Two programs demonstrate the usefulness of string concatenation.

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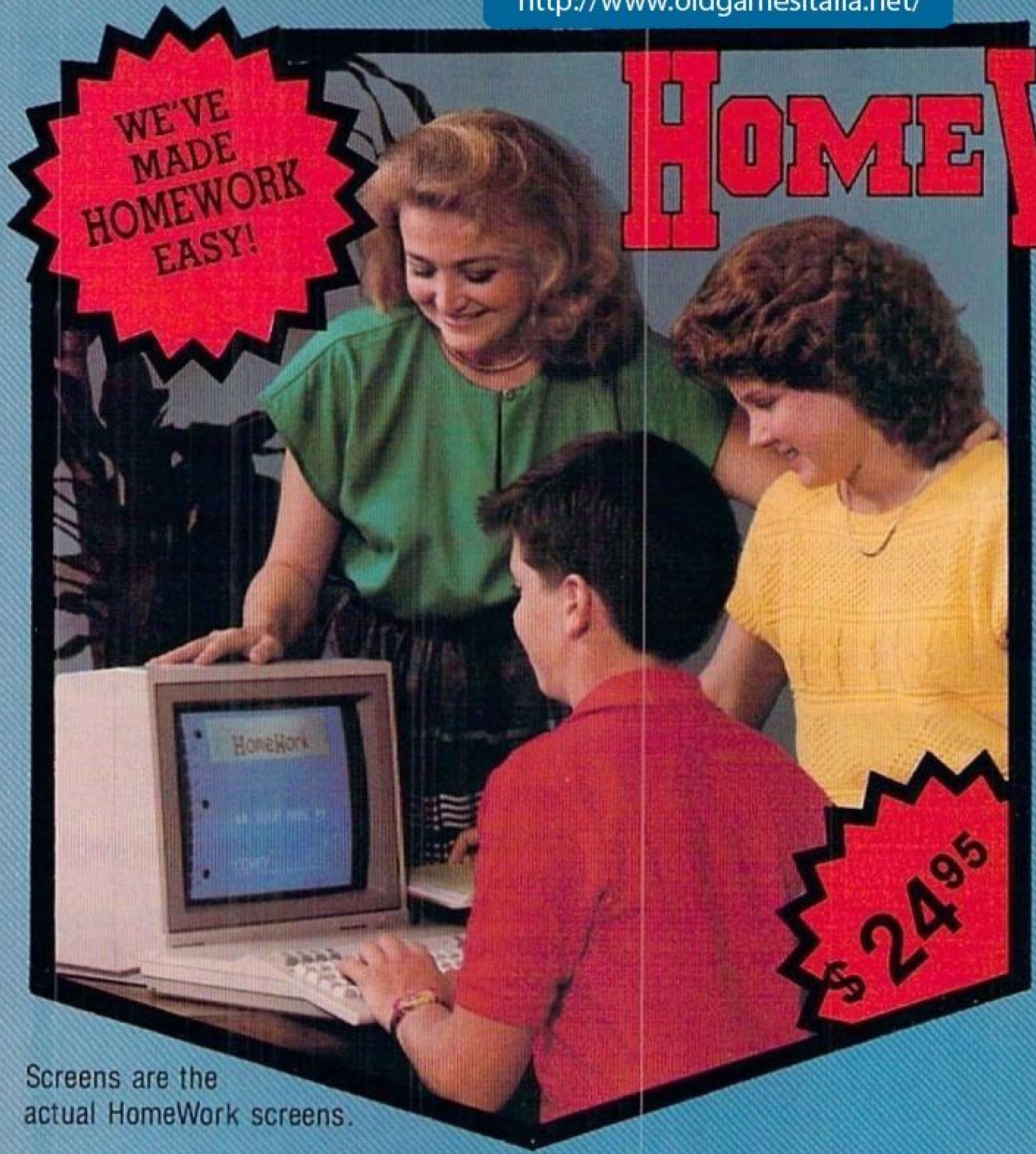

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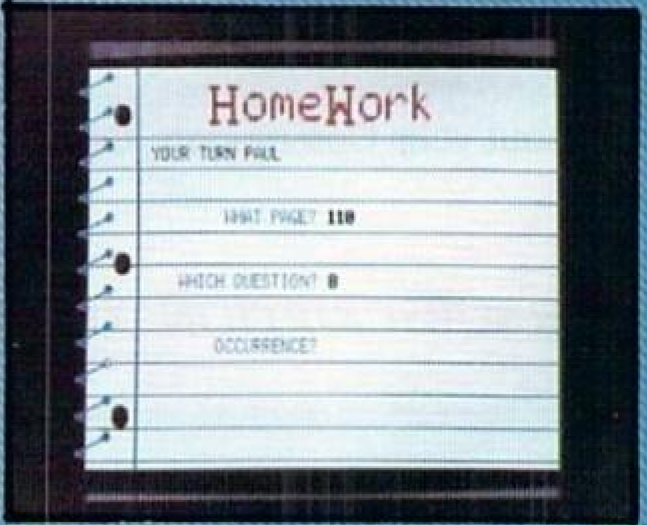

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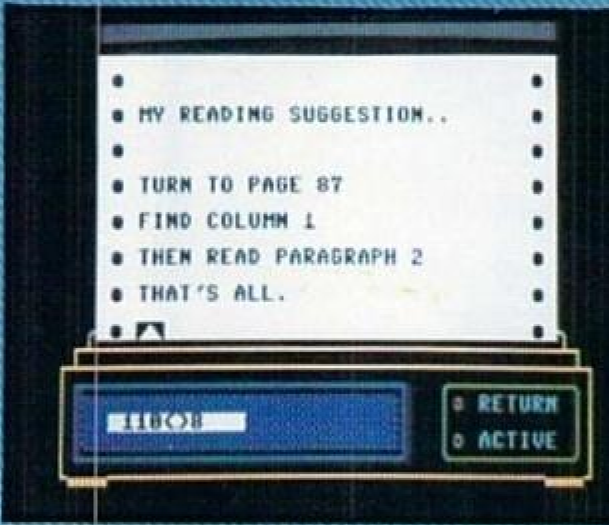

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COMPILED BY LOUIS F. SANDER

Tips & Tricks

Hints for Fun and Utility

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Louis F. Sander
P.O. Box 101011
Pittsburgh, PA 15237

If you enclose a self-addressed stamped envelope, we'll send you our hint-writer's guide. Readers outside the U.S. may omit the stamp.

C128 disk commands: Many of the BASIC 7.0 disk commands have parameters for device number and unit number. The device number is the same as the secondary address of the device in question, and is set by a switch or jumper on the device itself. It is normally set to 8 for the first 1541 or 1571, 9 for the second, and so on. The unit number is for those devices, such as the 4040, which have two disk drives built in. For those devices, unit 0 is the first drive, while unit 1 is the second. For devices having only one built-in drive, such as the 1541/1571, the unit number is always 0.

All the BASIC 7.0 commands use device 8, unit 0 as defaults. That is, unless you specify otherwise, the command will be sent to the first drive on device number 8.

But you can easily specify another drive or unit. These two parameters are usually given after any other required parameters, and can be given in unit/drive or drive/unit order. The drive number is always preceded by a D, and unit number is always preceded by a U.

For example, the command DIRECTORY will call up a full directory of drive 0, unit 8, while DIRECTORY,D1,U9 will get a directory for drive 1, unit 9. DIRECTORY,,U9 will call up a directory for drive 0 on device 9. The D0 can be omitted (but not the commas) because the drive 0 is the default drive.

The ON clause can be used to skip any parameters preceding the drive or unit you specify. For example, DIRECTORY ON U9 will give the directory for drive 0 on device 9.

Charles Lavin
Coral Gables, Florida

C128 key hint: I love to type the programs from this column, many of which include data statements in a distinctive format. To make typing as easy as possible, I set up a function key to produce the framework of the data lines, and I use the AUTO command to generate the line numbers. After using the function key to produce a dummy line, I fill in the numbers for the DATA items. Here's how I set up my function key

```
KEY7,"DATA 000,000,000,000,000,000,000,000" + CHR$(13)
```

John P. Todd, Sr.
Stanley, New Mexico

C128 F-key keeper: If you redefine your function keys within a program, it's nice to get the original key assignments back when the program is finished. You can accomplish this easily with the following lines. Execute the first one before redefining your keys, and execute the second at the end of your program.

```
10 DIMK%(255) : FOR J=0 TO 255 : K%(J)=PEEK(4096+J) : NEXT
65535 FOR J=0 TO 255 : POKE 4096+J,K%(J) : NEXT
```

R. Harold Droid
Seattle, Washington

C128 PLAY statement: You can use string variables as arguments for the PLAY statement, as illustrated on page 156 of the 128 system guide. If you want to put more than one variable in a single statement, you can do so by using the plus sign to concatenate them. For example,

```
10 PLAY A$ : PLAY B$ : PLAY C$
```

can be more easily accomplished by

```
10 PLAY A$ + B$ + C$
```

Jacob M. Smith
Silver Creek, New York

Tips & Tricks

C128 and machine language: The C128 has a nice machine-language monitor that can also be used on the C64 side of the computer. The way I do it is to write the C64 machine-language program while in C128 mode, observing all the rules and memory locations for the C64. When I'm finished, I go to C64 mode by pressing the Reset button while holding the Commodore key. I then SYS to the start of the machine language program and see the results of my handiwork.

Joe Grossinger
El Paso, Texas

C64 to PET conversion: Many schools are still using Commodore PET computers, which cannot directly load programs written on the C64. The BASIC on the two machines is very similar, so C64 programs can run on the PET, if we get them to load. If you're willing to do some finagling when saving or loading, your PET will readily digest what the C64 turns out.

If a program has been saved in the conventional way on the C64, you can load it into the PET by following these steps:

1. Put the disk in the PET drive.
2. Type the following, ending each item with a RETURN:

```
0 REM
POKE 2048,0
```

3. Load the program as you normally do.
4. Type these lines, ending each one with a RETURN:

```
POKE 1025,1
POKE 1026,8
```

5. Delete line 0.
6. Save the program onto a different disk.

The program you have saved can now be loaded into the PET with no special steps required.

If you want to save a program from your C64 so it can be loaded directly into the PET, do this:

1. Type the following on one continuous line, ended with RETURN:

```
POKE56576,5 : POKE53272,4 : POKE648,128 : POKE 1024,0 : POKE44,4 : POKE56,128 : NEW
```

2. Clear the screen.
3. Load your program into the C64.
4. Save the program onto a different disk.

The program you have saved can be loaded directly into the PET.

Arthur A. Abramovitch
Gloucester, Ontario Canada

Reviving dead computers: I killed my Commodore 64 by shorting the wrong contacts in an abortive attempt to reset it. Fearing the worst, I was mentally prepared for a $100 repair bill and a long absence from the joys of computing. But since I'm a decent electronics tinkerer, I opened up my computer to see what a blown 64 looks like. To my great surprise, I found a glass fuse inside, obviously blown. I went to my local electronics store a got a 1.5 amp 250 volt fast-acting fuse, which I substituted for the dead one. Needless to say, the computer came nicely back to life.

Chris Heller
Starkville, Mississippi

Please note: Opening your computer voids your warranty. If your warranty has expired, you still must be very careful.

MPS-803 ribbons: If you can't find these ribbons locally, look for a Brother M-1009 ribbon, which seems to be an exact replacement.

Gary Greer
Sylacauga, Alabama

Ribbon re-inking: It is messy and tedious to re-ink my MPS-801's inker cartridge one drop at a time. I avoid the mess by putting a few drops of ink into a 35mm film container or a pill bottle, then dropping my inker into it, felt tip first.

Ben Johnson
Address Unknown

Paper saver: Some stores sell plastic paper carriers that allow unperforated single sheets to be used in printers with tractor feed. Not only do these carriers let you print on standard sheets or letterhead, but they can help save paper as well.

Many printers such as the MPS-801 waste a sheet of paper at the start of each job, because the print head is several inches below the tractor mechanism. To place the print head at the top of a sheet, you must run the preceding sheet most of the way through the printer. But if you have one of the plastic paper carriers, you can use it to make up the missing inches.

Steve Hoffman
Address Unknown

Flippy disk trick: Do you use disks that have been converted to double-sided "flippies" by the addition of a second write-enable notch? Have you noticed that when such a disk is in the drive, you can't look at it and tell which side is being used?

I solve the problem by putting a silver write-protect tab on the top edge of the disk, about an inch from the left side of the disk. When the disk is in the drive, I can see the silver tab. If it's on the right, the normal side is being read. If it's on the left, it's the "flippy" side.

Joseph J. Jernigan
Chattanooga, Tennessee

Naming programs: My system of naming programs uses the wildcard capability to cut down on the amount of typing. When I get a disk, I name the files so each is prefixed by a unique two-digit number, i.e., 00, 01, 02, and so on. Then when I want to use file 03, I just type

```
LOAD "03*",8
```

If I am unable to remember the number, I enter

```
LOAD "??filename",8
```

This system takes a little effort to set up, but the convenience it provides is worth it.

Steve Moon
Duluth, Minnesota

Happy ENDings: Most of the programs I write have a menu, one selection of which sends the program to an END statement. This is fine when the user really wants to quit, but sometimes he has second thoughts, such as when he thinks of something he wishes he had done while the program was running. Doing a RUN at this point is fine, except that it resets all variables to zero and sometimes calls a long initialization routine.

To avoid this problem, I've changed the way I handle END statements. To illustrate, let's assume that the main menu starts in line 500 and that my END statement is in line 1000. My technique is to type

```
1000 END : GOTO 500
```

The program still terminates when line 1000 is executed, but now I have a chance to change my mind. All I have to do is type CONT [RETURN], and the GOTO 500 is executed, sending me back to the main menu! It's one of the simplest and most useful techniques I have in my bag of tricks.

Bob Howe
Tulsa, Oklahoma

Defeating program protection: Many simple program protection schemes involve something that interferes with listing the program to the screen. A REM followed by a shifted L will do this, as will various REMs with delete characters. Very often these schemes will be revealed if you list your program to the printer, rather than to the screen.

William F. Sander
Marietta, Ohio

Commercial software tip: If you have installed a reset button on your computer, you can sometimes use it to start commercial programs. On *Pole Position* and some others that are started by a SYS command, you need not remember or type the SYS. Just press the reset button, and the game will start in the usual way.

Javier Arano
Capital Federal, Argentina

Super Huey tip: If you have trouble with fuel consumption in this popular game, just land and shut off power. When you start up again, you will have a full tank of fuel. I know this works in EXP mode.

Keith Stevenson
Address Unknown

Print Shop envelopes: If you use the popular *Print Shop* program to make up greeting cards, you might have trouble finding the right size envelopes for them. I had that problem until I learned what to ask for.

Go to a well-stocked stationery store and ask for #5 1/2 Baronial envelopes. Many stores carry these in white and ivory, and they are sometimes available in other colors as well.

John Swingle
Seattle, Washington

Summer Games I: In the pole vault event, it is possible to go under the bar at six meters and up, with the jump still counting as a good one. Set your grip for low, and with a little practice you'll be vaulting like a real (?) champion.

Andy Desak
Monessen, Pennsylvania

Icing Winter Games: Here's a trick for everyone who has become frustrated with the one-minute figure skating event in this popular Epyx game. Complete one or two jumps, then repeatedly have the skater fall flat on her face. If the judges fall for it as much as your skater did, she'll end up with a perfect score.

Glen Conway
British Columbia, Canada

COMAL file copier: This program, written in COMAL 2.01, will copy PRG, SEQ or USR files of any length from drive 8 to drive 9. When entering the file name, you must end it with a comma and the one-letter file-type designator (P, S or U).

```
10 INPUT "FILENAME: ": name$
20 OPEN FILE 2,"0:" + name$,READ
30 OPEN FILE 3,"2:" + name$,WRITE
40 WHILE NOT EOF(2) PRINT FILE 3:GET
$(2,20000),
50 CLOSE
```

Ray Carter
Las Cruces, New Mexico

ML string printer: If you program in machine language on the C64, here's a short routine that will print out a string. The string must be in memory starting at location START, and it must end in a zero byte ($00).

```
LDA# lo byte of START
LDX# hi byte of START
JSR $AB1E
```

David Grabowski
Westfield, New Jersey

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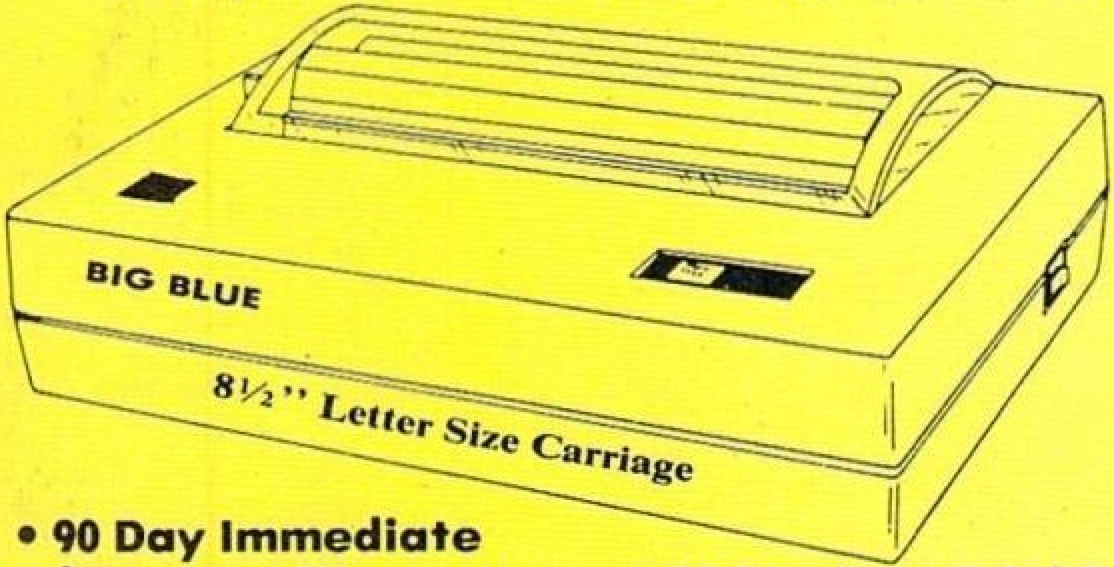

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3095	Alpha Build (C)	$4.95
3070	Dance Fantasy (C)	$4.95
3069	Linking Logic (C)	$4.95
3072	Memory Manor (C)	$4.95
3073	Logic Levels (C)	$4.95

Designware

5100	Algebra 1,2, or 3 (D)	$19.95
2518	Body Transparent (D)	$26.95
2517	European Nations (D)	$26.95
0824	Grammar Examiner (D)	$26.95
0832	States & Traits (D)	$26.95

Spinnaker

5300	Alphabet Zoo (C)	$4.95
5090	Delta Drawing (C)	$4.95
5301	Facemaker (C)	$4.95
5303	Kindercomp (C)	$4.95
3077	Number Tumblers (C)	$4.95
3078	Sea Spellers (C)	$4.95
3076	Up & Add 'Em (C)	$4.95

Weekly Reader

2515	Stickybear ABC (D)	$14.95
5130	Stickybear Math (D)	$14.95
2512	Stickybear Numbers (D)	$14.95
5132	Stickybear Reading (D)	$14.95
5126	Stickybear Spellgrabber (D)	$14.95
5129	Stickybear Typing (D)	$14.95
5128	Stickybear Townbuilder (D)	$14.95

Hayden

2160	Sargon II (D)	$9.95
0261	SAT Math (D)	$14.95
0262	SAT Verbal (D)	$14.95
2164	SAT Sample Tests (D)	$14.95

American Educational Computer

2493	Grammer Word Use (D)	$9.95
2499	Biology Facts (D)	$9.95
2521	AEC Spelling (D)	$19.95
2496	French Vocabulary (D)	$9.95
2495	Spanish Vocabulary (D)	$9.95
3747	Learn to Read (D)	$19.95
3745	Phonics (D)	$19.95
2519	U.S. Geography (D)	$9.95
2520	U.S. Goverment (D)	$9.95
2498	U.S. History (D)	$9.95

Business

C128 Software From Timeworks

5022	Word Writer (D)	$49.95
5024	Data Manager 2 (D)	$49.95
3048	Sylvia Porter (D)	$49.95
5030	Partner (C)	$49.95
5026	SwiftCalc/Sideways (D)	$49.95

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Near Letter Quality *Near Letter Quality*

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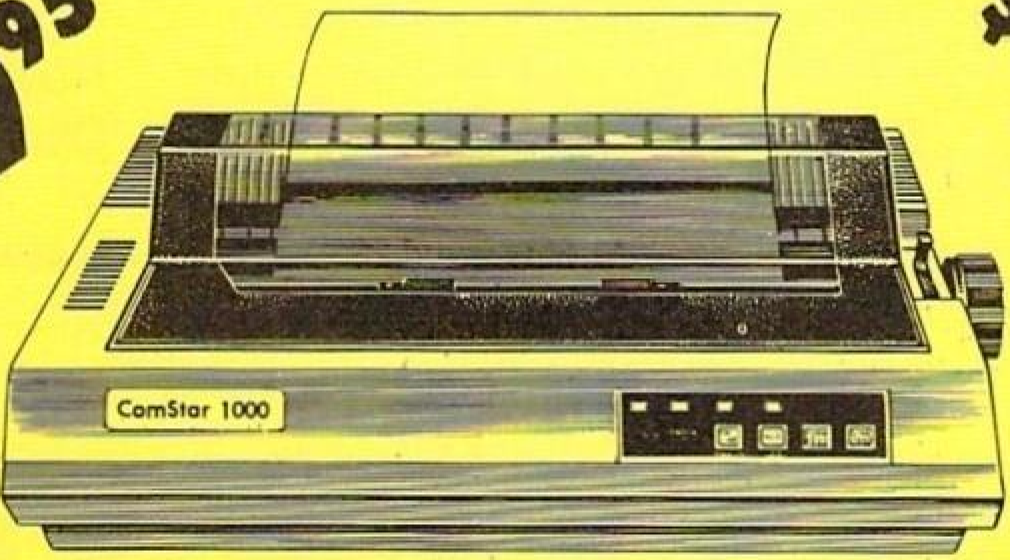

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The Comstar 1000 is one of the best values in the United States today. Print your letters, documents, programs, pictures, and more at a blazing 100 Characters Per Second or 20 cps in the Near Letter quality mode. (Looks just like it came from a typewriter.) Plus, choose your printing mode (NLQ, Draft) from your wordprocessor or by simply pushing the controls on the front panel. Fantastic Quality at a Fantastic Price.List $349.00 **SALE$179.95.**

Print Method
Serial impact dot matrix (9 pin)
Print Speed
Draft- 100 CPS NLQ- 20 CPS
Character Sets
96 ASCII Characters, Marker, Symbols (includes Italic font)

Ribbon (Life exp.)
Black: cassette (2.5 million characters)
Dimensions
15.4 (W) x 10.9 (D) x 4.7 (H) inch
Weight
Approx. 10 lbs
Character Spacing
Fixed

Line Spacing
1/6, 1/8, 7/72, and 1/216 inch
Paper Feed
Adjustable tractor and friction feed
Paper feeding Direction
Bi-directional
Copies
2 plus original

Supply is Limited so Buy Today

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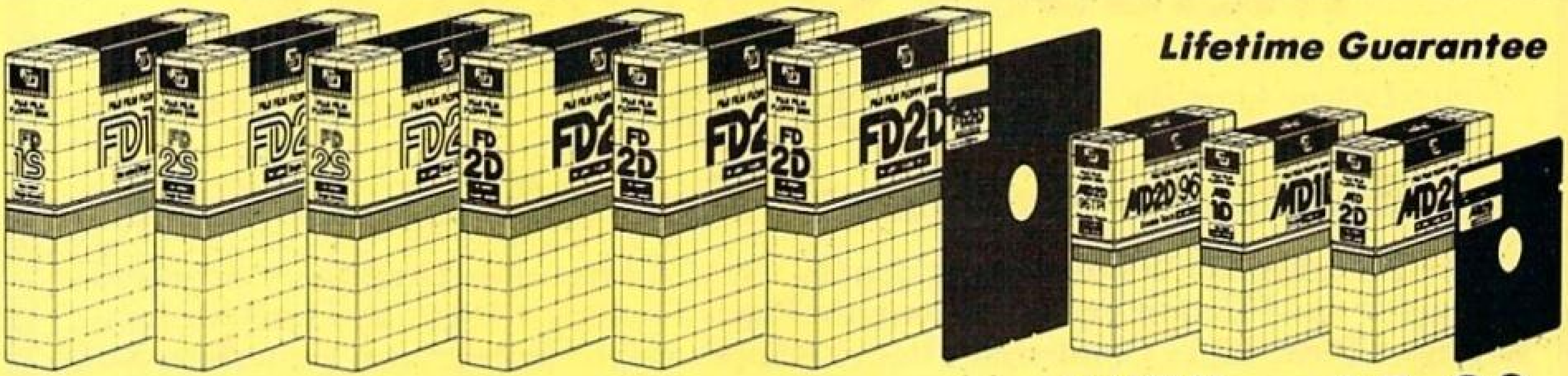
List $2.95

Premium Quality Floppy Disks



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Box of 10 *with hub rings, sleeves and labels*

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Single Sided — Double Density for Commodore 64, Atari, Apple

Super Special Deal Box of 10 Net Cost 59¢ ea.

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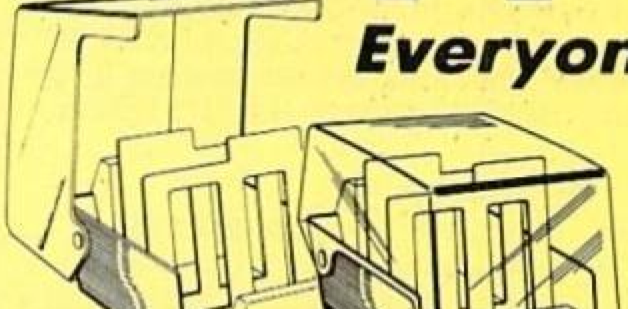
*** $12.95** ☆ ☆ ***Flip-N-File*** ☆ ☆ *** $12.95**

Flip/Sort

Floppy Disk Filer



Everyone Needs a Floppy Disk Secretary

Facts:

- Dust and Dirt particles can hurt your disks
- Most disks go bad due to mishandling in storage
- Proper filing of your disk collection will reduce unnecessary handling of your disks

The Floppy Disk Filer is an inexpensive hard plastic Fliptop case that will allow for easy filing, and protect your disks from dust, smoke, and dirt. Plus, the Floppy Disk Filer will keep all your disks out of unwanted hands and in one place where you can easily find them. **(Holds Over 50 Disks)**

List $24.95 **Introductory Sale Price $14.95** **** Coupon $12.95***

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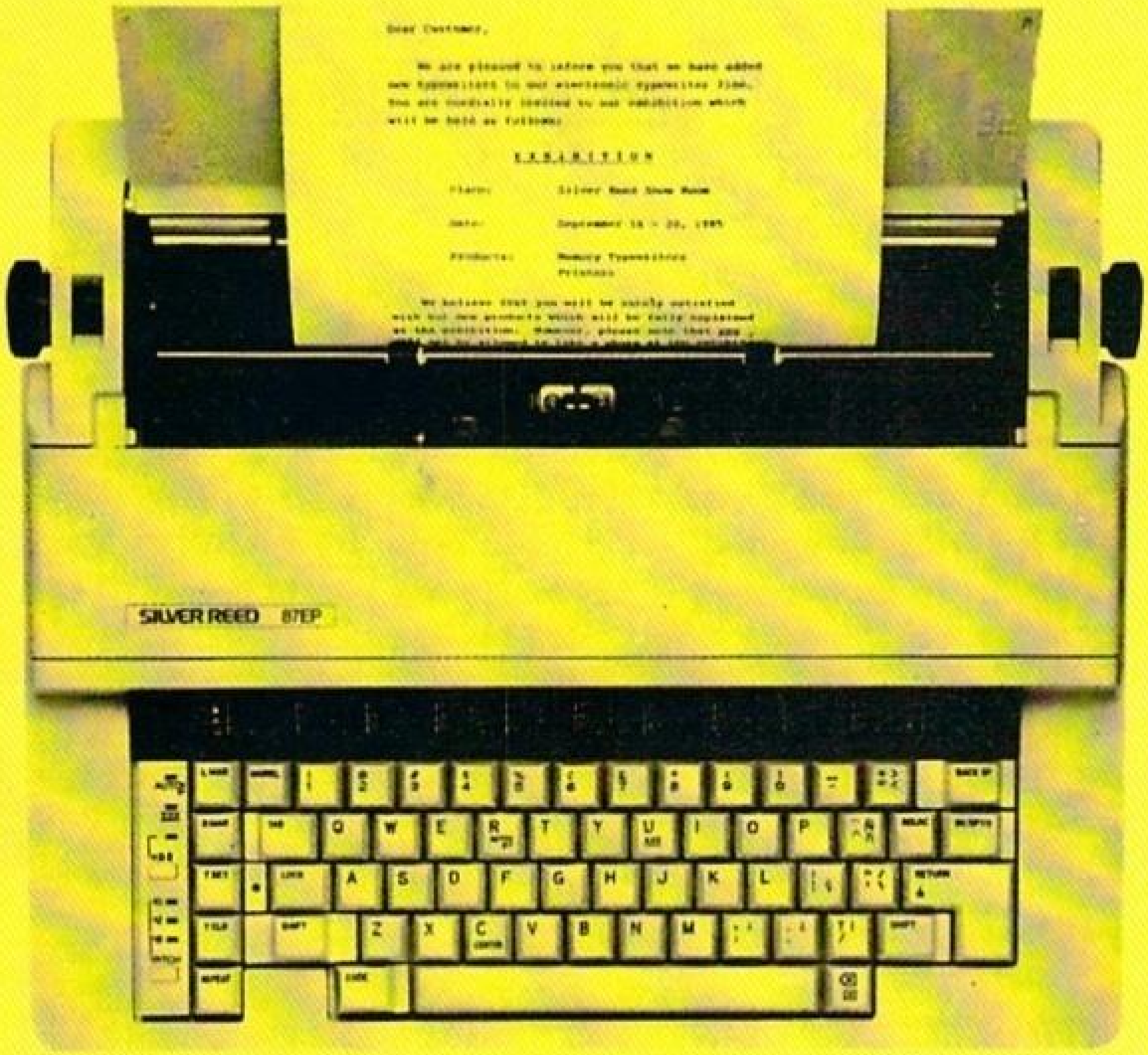
• Superb computer business printer combined with the deluxe electronic typewriter • Two machines in one — just a flick of the switch • Superb Letter Quality correspondence • 12" Extra Large carriage • Drop in cassette Ribbon • Precision Daisy Wheel printing • Key in Buffer • Centronics Parallel interface

Sale $\$199^{95}$



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Now you can have the advantages of a letter quality Daisy Wheel printer and the convenience of a typewriter for one low cost. Use your wordprocessor to type the letters, then with just a flick of the switch, your typewriter can type the envelopes. This is a fantastic Printer and a fantastic Typewriter. Every student and home business needs this machine. List $299.00 **Sale $199.95**

Printer:	
Paper width	12 inches
Printing width	10 inches
Cassette ribbons	Correctable film, one-time film, and fabric
Correcting tapes	Lift-off and cover-up
Line space lever	0,1,1-½,and 2
Keyboard selector	I and II
Print pitch	10,12, and 15

Keyboard:	
Keys/characters	44/96
Automatic carrier return	
Automatic correction	25 ch.
Automatic underline	
Relocate key	
Tabulation	
½ back space key	

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***ECONOMY DISKS** For use with Commodore 64, Atari, Apple.

Good quality 5¼" single sided double density with hub rings.

Bulk Pac	100 Qty.	33¢ ea.	Total Price	$33.00
Box w/sleeves	10 Qty.	39¢ ea.	Total Price	$3.90

☆ C-128 Computer Disks ☆

CADILLAC QUALITY (Double Sided, Double Density) ***Specifically designed for use with C-128***

- ***Each disk certified***
- ***Free replacement lifetime warranty***
- ***Automatic dust remover***
- ***Works with IBM PC***

For those who want cadillac quality we have the C-128 Floppy Disk. Used by professionals because they can rely on C-128 Disks to store important data and programs without fear of loss! Each C-128 disk is 100% certified (an exclusive process) plus each disk carries an exclusive FREE REPLACEMENT LIFETIME WARRANTY. With C-128 disks you can have the peace of mind without the frustration of program loss after hours spent in program development.

DOUBLE SIDED **59¢ Each**

100% CERTIFICATION TEST

Some floppy disk manufactures only sample test on a batch basis the disks they sell, and then claim they are certified. Each C-128 disk is individually checked so you will never experience data or program loss during your lifetime!

FREE REPLACEMENT LIFETIME WARRANTY

We are so sure of C-128 Disks that we give you a free replacement warranty against failure to perform due to faulty materials or workmanship for as long as you own your C-128 disk.

AUTOMATIC DUST REMOVER

Just like a record needle, disk drive heads must travel hundreds of miles over disk surfaces. Unlike other floppy disks the C-128 smooth surface finish saves disk drive head wear during the life of the disk. (A rough surface will grind your disk drive head like sandpaper). The lint free automatic CLEANING LINER makes sure the disk-killers (dust & dirt) are being constantly cleaned while the disk is being operated.

C-128 Disks are definitely the Cadillac disk in the world

Just to prove it even further, we are offering these super LOW INTRODUCTORY PRICES

1 Box of 10 — $5.90 (59¢ ea.) **5 Boxes of 10 — $29.50 (59¢ ea.)** **10 Boxes of 10 — $59.00 (59¢ ea.)**

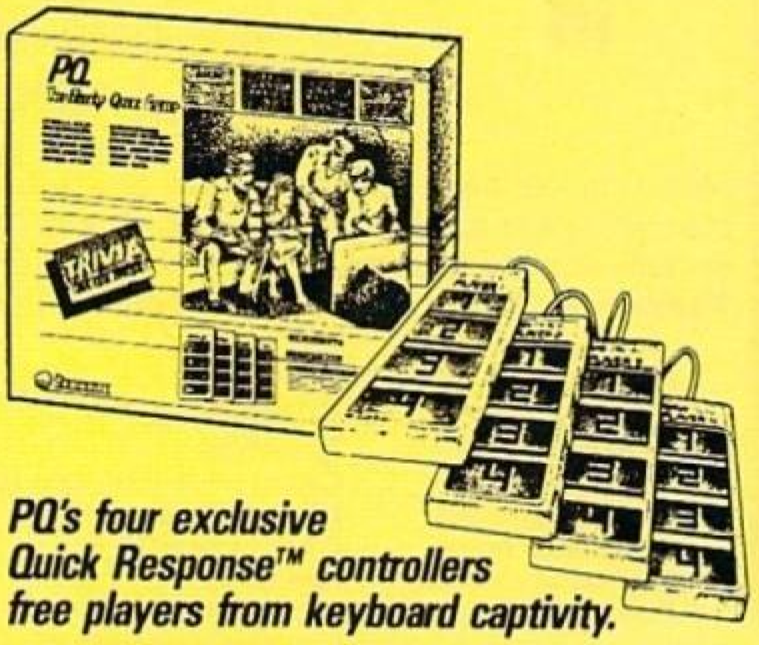
0029 Paper Economy Sleeves (10) 50¢
0030 Paper Economy Sleeves (100) $5.00

☆ ☆ COMMODORE 64 ☆ ☆

PARTY QUIZ ONLY $14.95

Trivia Controller & Software

Discover a better way to learn while you play, at a new, low price. Learning and entertainment are probably the reasons you bought a home computer. We've created a new, unique hardware/software system, like nothing ever produced for home computers, that satisfies those two motivations. It's called PQ, The Party Quiz Game. Included in each package are four special controllers (one for each player), a program disk and General Edition 1 disk containing 2700 questions covering a variety of subjects. PQ's Question / Answer Library (6 optional packages) expands the total number of questions to over 18,000. PQ asks the players a question; all are allowed to respond at once. Points are awarded for correct answers which are displayed on screen after a time elapses. All age and education levels, from reading age on up, can play thanks to PQ's "handicap" feature. Find out for yourself why Party Quiz gets 4 star ratings. List $49.95. **Sale $14.95.**



PQ's four exclusive Quick Response™ controllers free players from keyboard captivity.

Additional Trivia Software Modules

	List	Sale
General Edition 2,3 (specify)	$39.95	**$12.95**
Sports Edition	$39.95	**$12.95**
Education Edition	$39.95	**$12.95**
Bible Edition	$39.95	**$12.95**
Entertainment Edition	$39.95	**$12.95**

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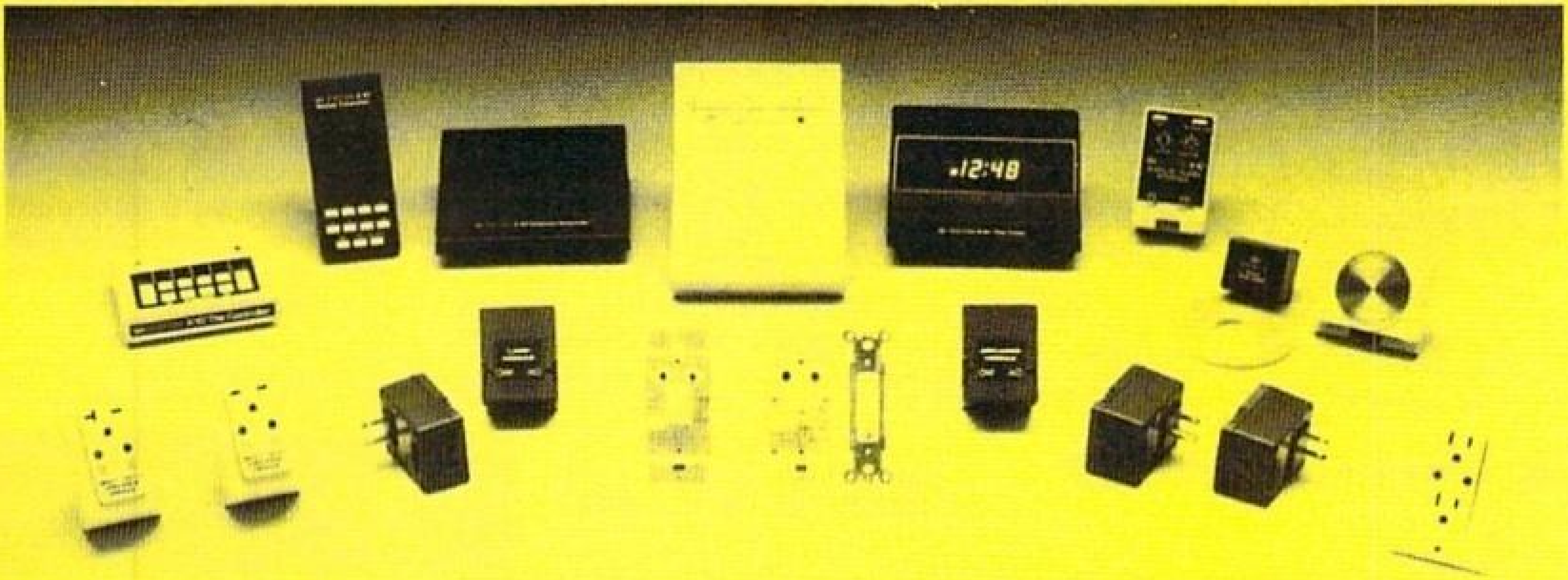
Controls Lights, Appliances, Thermostats, and More Throughout Your Home for Added Convenience, Security, Safety, and Energy Savings. Without Tying Up Your Computer

$\$49^{95}$ $\$49^{95}$

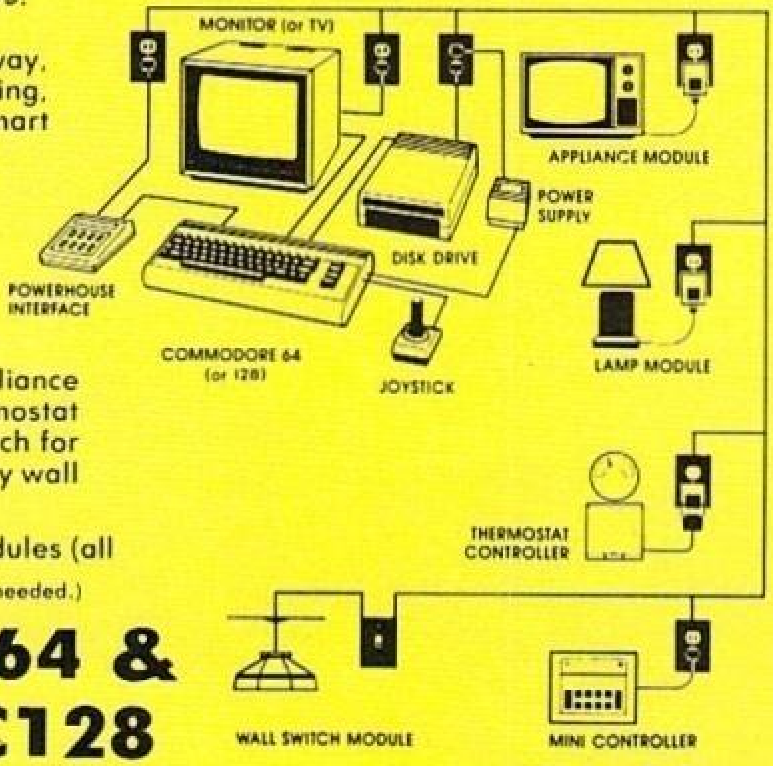


The X-10 POWERHOUSE Computer Interface is programmed from your Commodore 64 or 128. You can then turn off your computer or use it for something else. It does not tie up your computer. The software shows a graphical representation of your home and allows you to select a room, then select a light or appliance to be controlled, all just by pointing with the joystick. The interface sends digital signals over your existing house wiring to control your lights and appliances which are connected to plug-in modules (sold separately) List $99.95. **Sale $49.95.** *Coupon $39.95.*

It can wake you up to stereo or TV news. Light up your bedroom, hallway, bathroom. Start the coffee, start your central heating or air conditioning, warm up the curlers, all before you even get out of bed. But it's smart enough not to wake you up on weekends. At night it can lower the heat, play music or your favorite late night TV show for as long as you want, and can first dim and later turn out the lights automatically.

Many types of modules are available including appliance modules for TV's, hi fi's, coffee pots, etc. Lamp modules which contain a dimmer and can be used for incandescent lamps up to 300 watts. Wall switch modules which also contain a dimmer and can be used for incandescent outside lights and ceiling lights of up to 500 watts. 220V heavy duty appliance modules for 220V air conditioners and water heaters. The thermostat controller for central heating and air conditioning. The 3 way wall switch for controlling incandescent lights operated by two switches. The heavy duty wall receptable module to replace your existing wall receptable, etc.

Plus, works with BSR, GE, Leviton, Radio Shack, and Sears Roebuck modules (all 256 codes addressable). (Price does not include modules, please order modules as needed.)



Control Modules

	List	Sale
Lamp Module — 300 W incandescent	$19.95	**$14.95**
Wall Receptacle — replacement outlets	$24.95	**$19.95**
Wall Switch — turn on/off dim/brighten	$19.95	**$14.95**
3 Way Wall Switch — incandescent lights, for lights controlled by 2 or more wall switches.	$24.95	**$19.95**
Thermostat Controller — controls your existing thermostat	$39.95	**$29.95**

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C64 & C128

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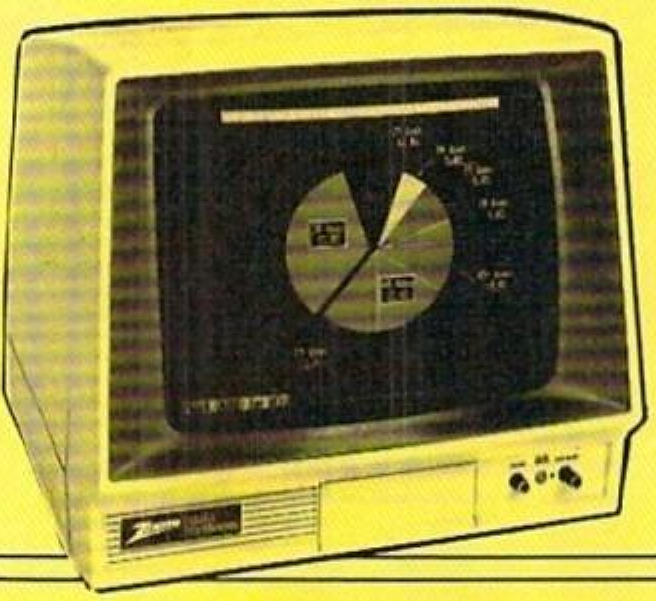

TV/MONITOR SCREEN RESTORER & CLEANING KIT

Sale $9.95

Reduce eye fatigue by increasing the clarity of your TV or monitor screen. This kit contains a hard wax formulation to cover surface imperfections on TV screens and monitors. This restores maximum optical clarity, making what you see more distinct. Plus high absorbency cloths and an auto static spray cleaner allows you to clean your screen on a regular basis to keep your screen looking better than new. (This is a must for those who watch monitors or TVs for extended lengths of time.) List $19.95. **Sale $9.95.**

DISK DRIVE CLEANER

Reg. $19.95.
Sale $9.95

- 60% of all drive downtime is directly related to poorly maintained drives.
- Drives should be cleaned each week regardless of use.
- Drives are sensitive to smoke, dust & all micro patricles.
- Systematic operator performed maintenance is the best way of ensuring error free use of your computer system.

This unique twin slot jacket design gives twice as many "wet-dry" cleanings per rotation as other leading brands. Non abrasive, 100% lint free, random fiber cleaners capture dust, smoke particles and disk oxide build up which insures you against disk and data loss from dirty disk drive heads just like you must clean your albums and tape players you must clean your disk drive heads to keep your disk drive working well. (24 cleanings per kit.) List $19.95. **Sale $9.95.**

MEMTEK PRODUCTS
5¼" DISK DRIVE HEAD CLEANING KIT

ANTI-STATIC KEYBOARD CLEANER

Sale $9.95

Now you can clean your computer keyboard fast, efficiently, and safely. The keyboard cleaning solution is exclusively formulated to remove skin oils, dust, and dirt that can destroy your equipment. Plus this non residue solution with anto-static properties will not build up like ordinary household cleaners so you can clean as much as you like without worry. Plus the lint free, high absorbency, non-abrasive cloths will not scratch or mar your equipment as they pick up dirt and grime in a matter of seconds. List $19.95. **Sale $9.95.**

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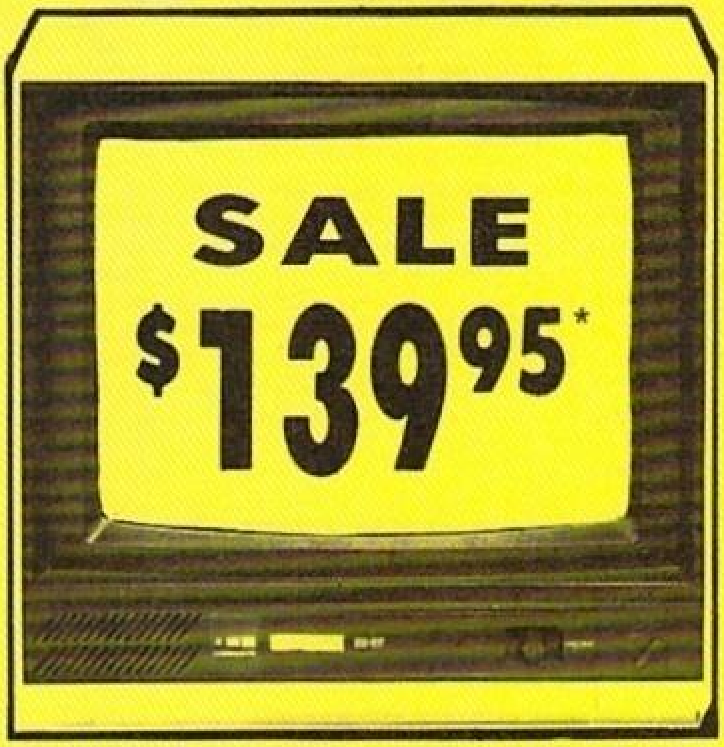
Color Monitor Sale

Sale

16 COLORS



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- **For Video Recorders**
- **For Small Business Computers**
- **Apple - Commodore -Atari - Aplus 3000 -etc.**
- **One Year Warranty'**

(Premium Quality)

- **Beautiful Color Contrast**
- **High Resolution**
- **Sharp Clear Text**
- **Anti-Glare Screen**
- **40 Columns x 24 Lines**
- **Front Panel Controls**

80 Columns

RGB

Super High Resolution

13" Color Computer Monitor'

*C64/Atari composite cable $9.95

* C128 RGB/Composite 80 column cable $19.95.

List $329.00

Sale $139.95*

Add $14.50 Shipping

14" RGB & Composite Color Monitor

Allows use of C-128 and C64 mode - composite and 80 column RGB mode. Must be used to get 80 columns in color with 80 column computers. Specially designed for use with the C128's special composite video output, plus green screen only option switch. (add $14.50 shipping)

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Sale $239.95*

12" 80 Column Green/Amber Monitor

Super high resolution composite green or amber screen monitor. 80 columns x 24 lines, easy to read. Fantastic value. Limited Quantities.

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9" Samsung Hi Res Green Screen Monitor

Super High Resolution 80 column monitor perfect for Apple & Laser 3000/128 computers. Fantastic Value. Very Limited Quantities.

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Turn Your Monitor into a TV Set Without Moving Your Computer

Elegant TV Tuner with dual UHF/VHF selector switches goes between your computer and monitor. Includes mute, automatic fine tuning and computer-TV selector switches. Inputs included for 300 ohm, 75 ohm, and UHF. Can be used with cable TV and VCR's. Fantastic Value. Limited Quantities. (Includes loop antenna for UHF & RCA connecting cables) (Add $3.00 Shipping. Plus $3.00 for APO/FPO).

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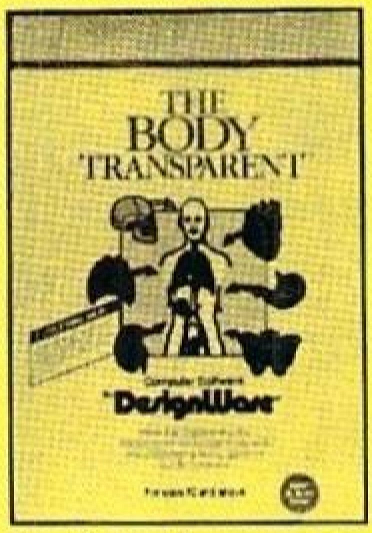
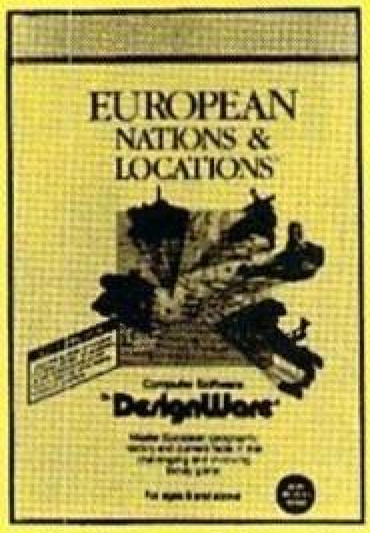
Rated No. 1 in Computer Education



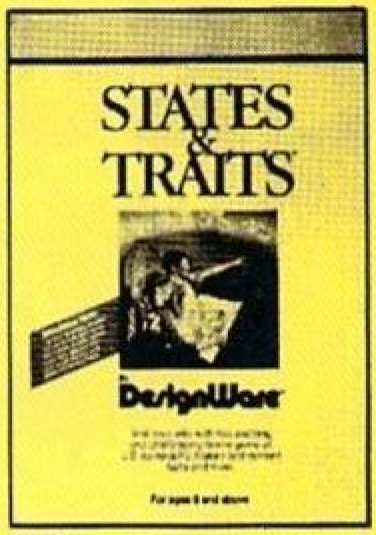
DesignWare

Commodore 64 SALE



DesignWare

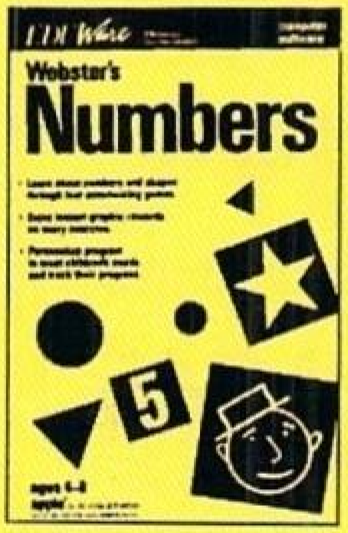
Commodore 64 SALE



The Body Transparent — Learn basic anatomy as you play a game of facts and functions of the human body. Choose a male or female body and move bones and organs to their proper location. Then learn what functions the body parts perform. Find out where food is digested, the importance of kidneys and much much more. Add your own biology questions to help make homework fun or to challenge a friend. The game has multiple difficulty levels and bonus points for fast answers, plus color graphics. (Disk) List $44.95. **Sale $26.95.**

European Nations and Locations — An exploration of the continent that combines important facts and information in a challenging game format. The only European geography program that allows you to add questions of your own. If you miss a question during game play it is recycled to guarantee learning. Each game, you move nations to the proper location on a map of Europe. The map fills in with color as questions are correctly answered. Fast answers are rewarded with bonus points. Winner of the Parents Choice Award. (Disk) List $44.95. **Sale $19.95.**

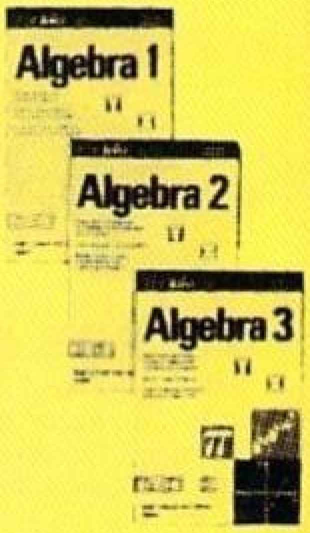
States & Traits — A valuable learning tool for geography and history students. Learn basic geography and then go on to find out interesting facts about every region in the country. Find out where historical events happened on the map. As you play quick answers are rewarded with bonus points. In the "States" part of the program you must move states into the right place on the map and the state lights up in bright color. In "Traits" you identify state capitals and landmarks. You can also design your own games. (Disk) List $44.95. **Sale $19.95.**



EDUWare

Webster's Numbers — Introduce your young children to basic arithmetic concepts with this program that combines lively animation with four action games. For children with minimal reading skills, they will learn shape discrimination, eye-hand coordination, number recognition and sequential counting to name just a few. Children will delight in maneuvering a hot air balloon, leading a mosquito to safety and pushing blocks and triangles into different shapes. (Disk) List $39.95. **Sale $19.95.**

Algebra 1, 2, or 3 — An introduction to Algebra concepts and definitions. Helps students master the fundamentals of first year Algebra, addition of real numbers, multiplication of real numbers, solving equations, solving inequalities and absolute value sets. Students can learn in 4 ways: They can work the sample problems, read discussions of concepts, watch equations being solved, or study rules that govern mathemetic operations. The result is that the student creates a learning process that he or she is most comfortable with. (Disk) List $39.95. **Sale $19.95.**



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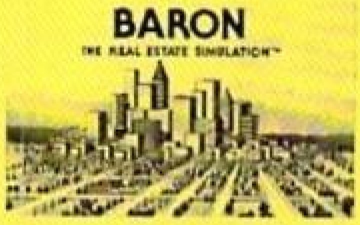
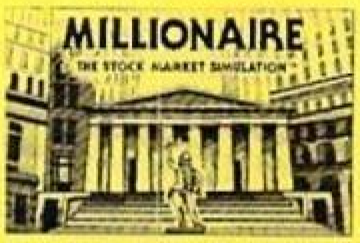
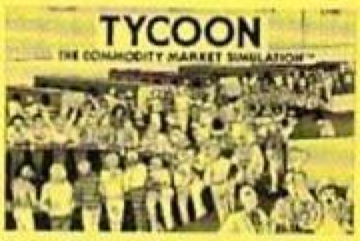


Baron — If you were given the opportunity to invest in real estate with a complimentary sum of money, say $35,000 and a time limit of 52 game-weeks to turn that into a million, how would you proceed? Baron is a program that offers you the chance to find out what your chances of success in this complicated venture will be. You must utilize the allocated funds wisely in buying, selling and developing land because real life influences like fluctuating mortgage rates and other headaches that affect property owners will be apparent during play. (Disk) List $29.95. **Sale $16.95.** *Coupon $14.95.*



Millionaire — Put yourself in high gear and join the risk takers, because you are about to experience the New York Stock Exchange. To get you started in investments you are given $10,000 and 15 stocks from 5 industry categories. Learn the market as you are faced with influences based on true to life events, good judgment is essential to whether you buy or sell and the status of your personal portfolio depends on making the right choices. Includes an introduction to buying-on-margin, call options, put options, and borrowing against your net worth. (Disk) List $29.95. **Sale $16.95.** *Coupon $14.95.*



Tycoon — It takes an individual with loads of confidence and driving ambition, to deal in the commodities marketplace. To foresee market trends and develop a plan of action before trading, are talents that can make or break you as you deal in precious metals, oil, grains and other items of necessity. Armed with charts and details from real-life situations of the past, you can research the market and make your move accordingly. The element of risk makes the game play a real challenge for all aspiring tycoons, or even established entrepreneurs. (Disk) List $29.95. **Sale $16.95.** *Coupon $14.95.*

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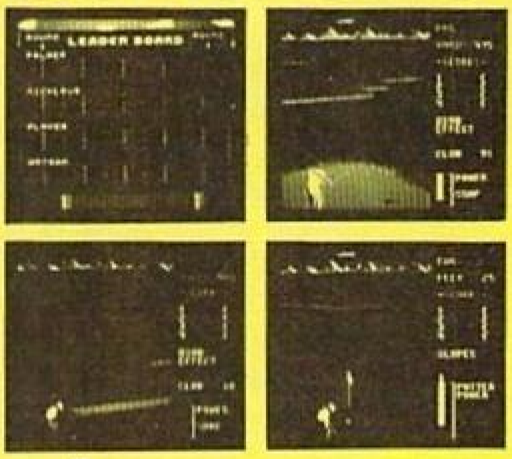

Leader Board

This is not just another golf program, it is the most realistic one on the market because it is really a simulator that allows true perspective of the game. Three levels of play take you from beginner to pro. The courses are difficult and require concentration to come in under par.
(Disk) List $39.95. **Sale $23.95.** *Coupon $22.95.*

Disk No. 1 — Courses for Leader Board. Four different golf courses are on this disk of varying degrees of difficulty.
List $19.95. **Sale $13.95.**

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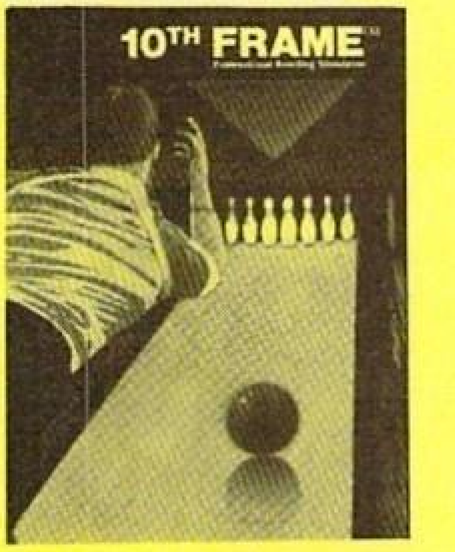
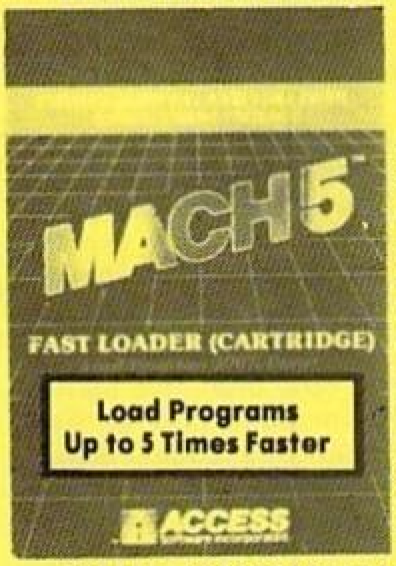


10th Frame

Put on those bowling shoes, get out that bowling shirt, the lanes are waxed and ready to roll in this new bowling program, 10th Frame. This simulator captures the look and feel of real bowling through outstanding graphics and use of true perspective. The multiple levels of play, and automatic scoring make it the perfect program for everyone. The ball is joystick controlled and realistic sound and pin action are featured. Up to eight different bowlers can play including league play. So don't fight the crowds anymore, set up your personal alley at home and bowl away. (Disk) List $39.95. **Sale $23.95.**

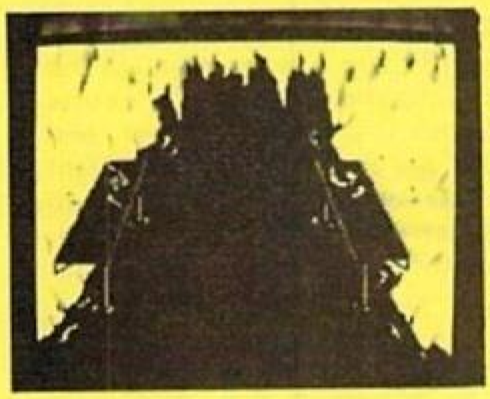


Disk Drive Speeder-Uppers

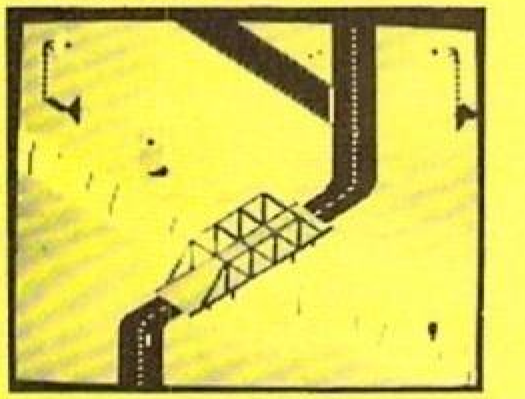
Mach 5 — Plug Mach 5 into the cartridge port and turn on the computer, the cartridge works automatically to load programs up to 5 times faster than normal. Loads 99% of all software, even copy protected games. Works with all popular printers. Will list directories without disturbing programs in memory. Commands such as LOAD, SAVE, OPEN etc. are executed with one keystroke. More features than most other "fast loaders". Does not disturb RAM. (Cart.) List $34.95. **Sale $19.95.**

Mach 128 — This "fast loader" will load programs up to 500% faster on the 1541 disk drive or the 1571 drive in 1541 mode, plus it has features that make it one of the best on the market. A full help menu, screen dump, 95% compatibility, 10 second formatting, plus much, much more. (Disk) List $49.95. **Sale $28.95.**

MACH 128
ACCESS



Beachhead II — Fantastic hi-res scrolling screens will lead you to new levels of excitement. Three scenarios, each with fantastic scrolling screens, add great realism to the game. First you maneuver your helicopter past tanks and artillery to the fortress wall. Then you must time your moves quickly as you go through the opening and closing gates. Scene 2 starts after you drop your paratroopers and make your way to the dictators machine gun emplacement. You must attack the dictator and rescue his hostages. Finally in Scene 3 you have the final confrontation plus you can be the rescuer or the dictator and play against an opponent or the computer. Fantastic two player Head to Head action. Highly recommended. (Disk) List $49.95. **Sale $22.95**



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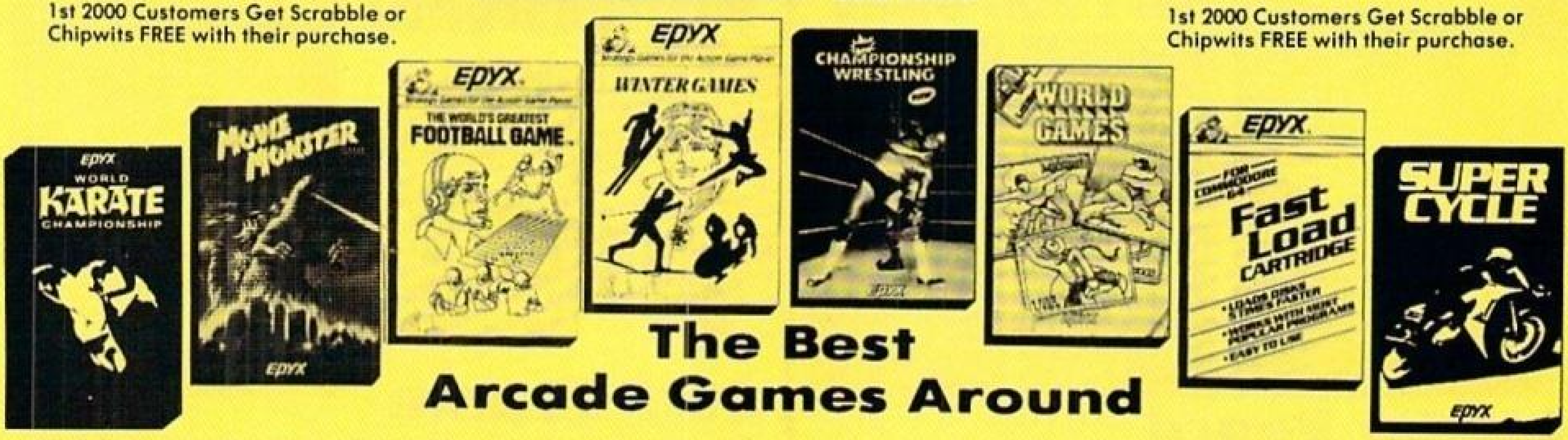

The Best Arcade Games Around

World Karate Championship — Become a Karate master! You must prove your ability as you earn your belts. Travel to four different cities to fight a series of opponents. There are 14 controllable moves, including kicks, blocks and front flips. The opponents become progressively tougher as skills improve. Start as a "white belt" in this exciting martial arts challenge. The character on-screen is realistic right down to facial expressions. Excellent graphics and background music. (Disk) List $34.95. **Sale $17.95.**

Movie Monster — Remember all those Saturday afternoons in front of the TV, with a big bowl of popcorn and an old Japanese monster movie? If you do then Epyx has created a program that will soon become a favorite in your software library. You choose the monster and control the outcome of the movie. The movies of the past always ended with the destruction of the monster but you can turn the tables by placing your creation in the hero role. Develop exciting plots for hours of fun. (Disk) List $39.95. **Sale $23.95.**

The World's Greatest Football Game — This one has it all — strategy, action, three views of the field. It's in a class all its own! Finally, a football game that not only puts you on the field, but also on the sidelines in the coach's shoes. Use the "Playbook" or design your own offensive and defensive plays. Then, grab the joystick and put your strategy to the test. You control key players to run a sweep, make a tackle, throw a pass and even kick a fieldgoal. All the action and all the strategy make this your favorite football game. (Disk) List $39.95. **Sale $22.95.**

Winter Games — Experience the challenge of six winter sporting events. In the Bobsled, you're right in the tube careening along the walls. At the SkiJump, you control your form in take-off, flight and landing. In Figure Skating, timing counts for the transitions, the jumps and landings. Choreograph your own routine in Free Style Skating. Hot Dog Aerials push your agility to new heights. The Biathlon challenges your endurance in cross-country skiing. There's even an opening ceremony, complete with national anthems. One to Eight Players.
(Disk) List $39.95. **Sale $23.95.**

Championship Wrestling — Jump in the ring with some of the roughest, rowdies in wrestling. These guys make the stars of the sport today look almost tame in comparison. Take out your frustrations with some viscious moves like Armspins, Body Slams, Headlocks, Elbow Drops and more. The crowd goes wild as you slam your opponent to the mat. You will crush heads, break kneecaps and smash noses. Strategy will make or break you and you will become so involved in the match that real-life concerns will fade away. Fast, fun and ferocious.
(Disk) List $39.95. **Sale $23.95.**

World Games — Travel the globe to compete in eight countries for the title of World Champion. The sporting events that you will test your skills in include Cliff Diving, Sumo Wrestling, Bull Riding, Barrel Jumping, Weight Lifting, Log Rolling, Caber Toss, and Giant Slalom. Play solo or with up to eight players. You are provided with background history of every country you visit, plus information on each event. Features award ranking and World Records Hall of Fame. Challenging and stimulating action.
(Disk) List $39.95. **Sale $24.95.**

Fast Load Cartridge — Load, save and copy disks five times faster than normal. It plugs into the cartridge port of the Commodore 64 and goes to work automatically loading disks with ease. And that's only the beginning. It can copy a single file, copy the whole disk, send disk commands, and even list directories without erasing programs stored in memory. (Cartridge) List $39.95. **Sale $22.95.**

Super Cycle — Experience the excitement and danger of motorcycle racing. Lean into the turns and cruise through the scenic Grand Canyon or the Rocky Mountains, as you race cross country. Measure your speed with your tachometer and speedometer. All the instruments are realistic. Features eight different courses, day and night racing and obstacles to challenge the driver, like road barricades, oil slicks and ice. The competition is stimulating and the graphics are first rate.
(Disk) List $39.95. **Sale $23.95.**

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Stickybear Typing — Stickybear makes learning the keyboard both easy & fun for anyone. A 3 game format provides different levels so that as typing skills improve so does the level of difficulty. ***Stickybear Keypress*** is geared to the needs of the child or the beginner, the stress is on the keyboard. To increase typing speed and accuracy the fast-paced ***Stickybear Thump*** will provide a real challenge. ***Stickybear Stories*** allows further practice with real text for timed practice. Everything from jokes, stories and bright amusing graphics make this one of the most delightful typing programs ever, plus you can keep track of your progress and store on disk. (Disk) List $29.95. **Sale $14.95.**

STICKYBEAR SPELLGRABBER

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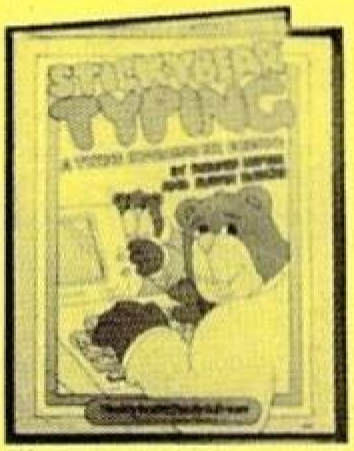


C64 SALE

STICKYBEAR MATH
Weekly Reader Family Software

Stickybear Spellgrabber — 3 games in one: Picture Spell contains over 200 word/picture combinations. Word Spell is a scramble game, players recreate words shown on the screen. Bear Dunk involves guessing a word to save Stickybear from a dunking. (Disk) List $29.95. **Sale $14.95.**

Stickybear Math — Kids learn math skills as they help the Stickybear Family out of sticky jams. For every set of addition and subtraction problems youngsters get right, Stickybear gets a step closer to getting out of the jam. (Disk) List $29.95. **Sale $14.95.**

Stickybear Town Builder
Kids develop essential map skills as they build a town with roads, parks, airports, bridges, etc. and save on disk. That's just the first game. In Take A Drive, Compass-reading and directions are stressed. With Find The Keys, follow clues to locate mystery keys. (Disk)
List $29.95. **Sale $14.95.**

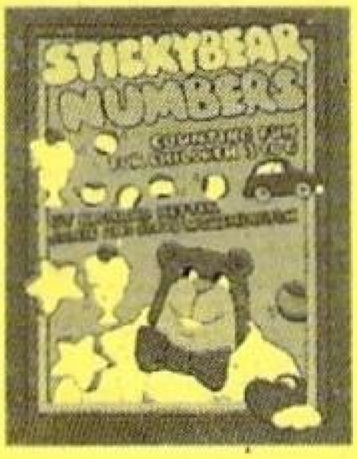
STICKYBEAR TOWN BUILDER
Weekly Reader Family Software

STICKYBEAR READING
Weekly Reader Family Software

Stickybear Reading
3 fun activities that build reading comprehension skills. Match The Words: Kids practice vocabulary as they match up word and picture sets. Find The Word: Turns the words in a sentence into animated action. Build A Sentence: Children choose a subject, a verb and an object, then watch them turn into a picture. (Disk)
List $29.95. **Sale $14.95.**

Stickybear ABC — Beautifully animated pictures help children learn their ABC's and become familiar with computers. Two full-screen, full-color pictures with sound represent each letter in the alphabet. Besides helping boys and girls become familiar with computers, Stickybear ABC teaches younger children to recognize and name the letters. Older children begin to recognize words on sight. (Disk)
List $34.95. **Sale $14.95.**

THE STICKYBEAR ABC



Stickybear Numbers — There are colorful groups of big moving objects, such as ducks, birds and bears, that reinforce numbers and counting skills. You can use the space bar to learn to count up and down. The many possible picture combinations work to captivate youngsters with an endless variety of picture shows and give them plenty of hands on computer experience. (32 page book, disk, colorful Stickybear poster, Stickybear stickers.) (Disk) List $34.95. **Sale $14.95.**

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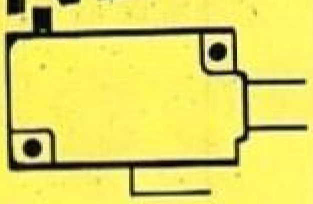

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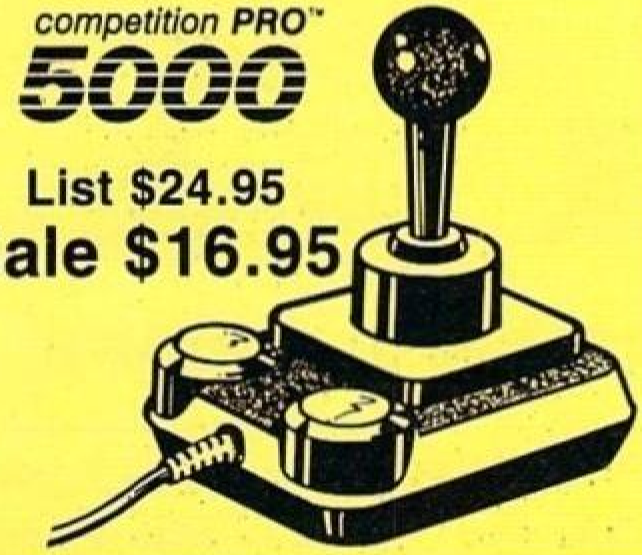

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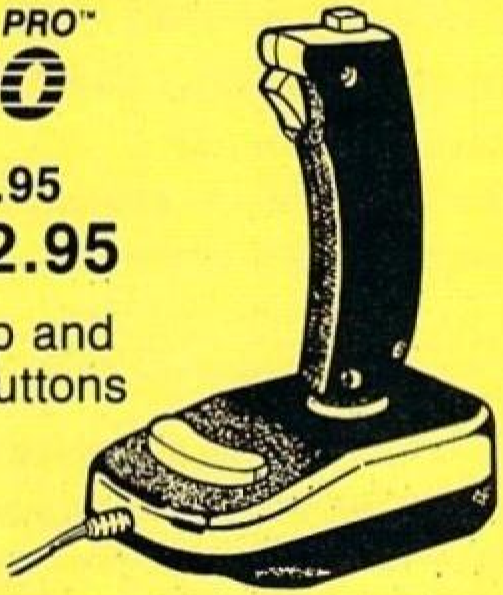

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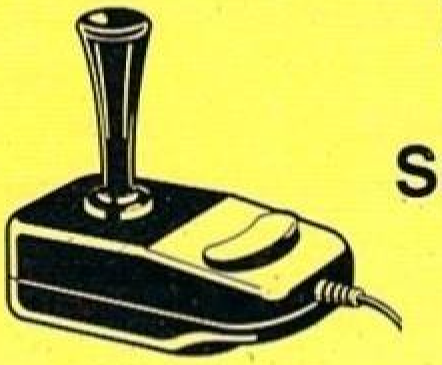

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BY MATTHEW LEEDS

From Bard's Tale II to Zuma Fonts

Previews of new entertainment products from the Valley—just released or in development.

Last week I attended a meeting of the **First Amiga User's Group**, based in the Silicon Valley. The meeting was impressive for a variety of reasons: the size of the turnout (over 200), the familiar faces in the crowd (Amiga's Jay Miner and R.J. Mical and Trip Hawkins from Electronic Arts) and the overall professionalism of the group. But most of all, I was blown away by a short video tape played at the beginning of the meeting. The tape was produced on an Amiga, using software created by **Octree Software** of New York.

The tape opened with a logo sliding across the screen, in a solid 3D display with no jitters, jaggies, or jumps. The scene cut to a futuristic city, zoomed down into the streets, and at breakneck speed, soared past building after building in a series of hairpin turns, finally skyrocketing back up to a bird's eye view of the city. The animation was smooth, clean, and had the same feel as $100,000 jobs done for network television. Needless to say, the crowd at the meeting exploded into applause. The feeling was electric.

Octree Software has created a hardware/software combination that controls a step-frame video recorder and produces high-resolution 3D graphics. The software is called *Caligari*. With it, you create a wire-frame scene, and use the mouse to draw paths for objects to follow. When you've finished designing the details of the video, the program creates a solid model, records a single frame on the video deck, and then generates the next image. Each frame takes from 15 to 60 seconds to generate, depending on its complexity.

The 80-second tape I saw took about two days to record. Details are sketchy at this point since the product is still under development, but current plans are for three resolution modes, including a Hold & Modify mode. The projected release is year's end.

> *I'm casting my vote for next year's winner of the Best New Game award.*

When I first learned to type in junior high school, I was given drills that consisted of business letters, book reviews, office memos and classical literature. It was a lot more interesting than the random strings of letters and numbers in some other self-teach typing books.

Broderbund Software has created a typing tutorial that uses the same principal. The program is *Type!* and runs on the 64/128. It prints out graphs and progress reports of your performance, saves the results of your lessons, and recommends customized exercises to improve your speed and accuracy. An arcade-style typing game is also included.

I've been asked time and time again—what can you use a computer for in the home? After all, how many people database their recipes, wordprocess their letters to friends, or spreadsheet their checking accounts? (No letters please, these are rhetorical questions.) Most appliances in the home are labor-saving devices, and new applications for home software should address the same needs.

PartyWare for the 64/128 from **Hi Tech Expressions** does; it is a party planning and design software package. *PartyWare* will print out banners, party hats, ribbons, place mats and place cards, party game ideas, thank you notes, and a party planning checklist. You can create an attendee data base of up to 60 names and addresses, and create personalized invitations, notes and greeting cards. You can also create an animated note on a disk and send a copy to a friend. Hi Tech Expressions has also produced a similar animated note program slanted toward friends and loved ones called *HeartWare*.

Brown-Wagh Publishing is distributing products by **Zuma Group, Inc.** Zuma Group has been in the business of creating graphics for the broadcast video market, and is now using their experience in that field to design software for the Amiga. Their first product is *Zuma Fonts*, three disks of fonts.

Each disk contains three fonts in six different point sizes and in low, medium, and high screen resolution. Point sizes range from 20 to 100 lines. These are display fonts, and are designed for high visibility and readability. Each library disk contains the Font Librarian, a utility that simplifies the installation procedure for fonts on your Workbench disk.

Zuma TV Text is a video production tool for adding animated titles to video tape. It uses any of the fonts available on the Amiga, in addition to fonts of its own. The high-resolution fonts can be displayed as italics, boldface, outline, metallic and extruded. Fonts can be displayed in any color, drop-shadowed or cast. Real-time effects include scrolls, crawls, fly-ins, pushes, reveals, dissolves and disintegrations. IFF-format graphics from other programs can be added as well.

Two other items coming soon from Brown-Wagh for the Amiga are *Organize!*, a database program, and the Amiga version of *Print Master* from **Unison World.**

Software is a big business, but it is usually created by small companies, consisting of individuals who are often relatively unknown. **Electronic Arts**, however, has an annual artist's symposium. They fly all their programmers in from all over the country (yes, most of their software is written by individuals or very small groups of programmers) and give them a chance to exchange ideas, put faces to the E-mail messages they've received, and attend an awards dinner.

During the appetizers at this year's symposium, slides of Electronic Arts' products were featured, as well as photos of all the programmers. The product that got the most applause was *Mule*, followed closely by *Worms*. I won't get into it, but *Seven Cities of Gold* was voted into the Hall of Fame, and *Deluxe Paint* won Product of the Year. *The Bard's Tale* won Best Creation of a New World.

I'm telling you all this because I want to cast my vote now for next year's winner of the Best New Game award. *Robot Rascals* for the 64/128 should win hands down. Created by Dan Bunter of **Ozark Softscape** (*Mule, Seven Cities of Gold, Heart of Africa*), it is very innovative.

You can't play this game by yourself. It requires a minimum of two players, unless you play against yourself (not much fun). Up to four players can play, and you can get more people involved by creating teams. You control a robot, and must retrieve four objects and return to home base before the other players.

Each robot has its own personality, style, and ability. You can handicap each robot to even out age differences among the players. You determine which objects you must retrieve by selecting four cards from a stack. Each card has a picture of the object you must find. By introducing cards into the game. Electronic Arts has added another item of interest for the younger players, and additional strategy elements for all. As in some other games, you can add card swaps, forced trades, and other card exchanges to increase the difficulty of the game. There are also wild cards, cosmic cheat cards, and killer cards.

You hunt for your objects over a landscape of plains, forests, rocks, swamps, and lakes. Each turn, you are allotted a certain amount of energy. You can use it to hunt for objects, teleport to new locations, or repair damage to your robot. Be sure to save some energy so at the end of each turn you have enough to put your shields up so other players don't steal things from you.

There is another set of cards in the game: luck cards. These induce a certain amount of randomness into the game. There are also 14 random events that can occur during each game. For example, the attributes of the objects might change or the lakes might dry up.

There are three levels: beginning, standard and advanced. The game is targeted at ages eight and up, but younger children can play when the adults aren't.

There's more to this game than I can go into. Strategy is very important, but so is luck. You don't get to shoot at or kill anything. The music that plays along with the game is great. Be careful about throwing anything in the lake, because robots can't swim. I highly recommend this game.

Also for the 64/128 from Electronic Arts is *Murder Party.* It's exactly what it sounds like. You tell the program who's coming for dinner, what their names are, what they look like, and their interests. The program then assigns a murder party, prints invitations, creates clues using the data you've input, and generally customizes the party. Sounds like great fun for budding detectives and mystery afficionados.

Other goodies coming from Electronic Arts include *Bard's Tale II, Amnesia,* and *Marble Madness,* all for the 64/128; and *Archon II Adept* and *Adventure Construction Set* for the Amiga. I've finally seen an advanced look at *Deluxe Music* for the Amiga—makes me want to go out and buy a DX-7. I'll have more details another time.

That's about it for this month. I've been writing this column for about six months now. Any comments? Cheers, jeers, tears, or bum steers, I'd like to hear your impressions (no Groucho Marx impressions, please). Send your comments to me in care of this magazine. Stay tuned.

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Brown-Wagh Publishing
100 Verona Court
Los Gatos, CA 95030
Electronic Arts
1820 Gateway Drive
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More than Star Wars

Part 2: Koronis Rift

In "More Than Star Wars, Part 1" (August/September, 1986, Commodore Power/Play*), Lucasfilm programmers talked about fractal theory and how they use it to create exotic graphic effects. In Part 2, the three programmers of* Koronis Rift*—Noah Falstein, Aric Wilmunder and Ron Gilbert—give a glimpse of what went on behind the scenes to create this game.*

BY JOHN JERMAINE

Koronis Rift is a complex space game that takes fractal graphics to the limit. The programmers who engineered this outstanding game—Noah Falstein, Aric Wilmunder and Ron Gilbert—give us an intriguing glimpse of what goes on behind the scenes.

Jermaine: Tell us a little bit about yourself.

Falstein: I've been fascinated with electronic toys most of my life. I began my career by working 2 1/2 years for Milton Bradley in Massachusetts. While I was there, I worked on ten projects ranging from electronic games to talking robots. Unfortunately, all of those interesting projects were cancelled before they hit the market.

By late 1983, Milton Bradley was getting out of the electronic business, so I decided to move on. I accepted a job offer from the Chicago-based Williams Electronics arcade game company, who immediately put me to work. My main contribution to this company was in the development of the Sinistar arcade game.

I shortly got the urge again to seek new surroundings and began working for Lucasfilm early in 1984. My original assignment was to contribute to the production of **Rescue on Fractalus!** and **Ballblazer.** Once these projects were finished, it was my turn to start a game, which eventually evolved into **Koronis Rift.**

Wilmunder: I first did contractual work for a company called Automated Simulations, which became Epyx. Late in 1982, I began working for Atari, spending one year in their Systems Research Division and another year in the Coin-Op Division. After I left Atari, I was self-employed for about three months creating game design projects. I started at Lucasfilm late in February of 1985.

Gilbert: I was employed by HES (Human Engineered Software) for about six months, and came to work for Lucasfilm in March of 1985. My job was to generate Commodore 64 programming, with **Koronis Rift** as my first project.

Jermaine: Before we go any further, tell me a little about **Koronis Rift.**

Falstein: The year is 2249 and you're a techno-scavenger, searching the galaxy for remnants of lost technology left behind by the Ancients. The Ancients were an extremely advanced group of civilizations who lived a long time ago. They developed extraordinary devices and powerful weapons, but for some mysterious reason, they vanished. You make your living scavenging worlds for this technology, which is very valuable throughout the galaxy.

One day, while examining the surface of a newly discovered planet, you accidentally locate the fabled Koronis Rift. All of the techno-scavengers know about this legendary testing ground of the Ancients, but noone has ever been lucky enough to find it. Who knows what the Ancients might have left there?

So you leave your scoutcraft behind and travel to the surface of the world beneath you in a tank-like vehicle. Driving across the landscape, you discover ships, tanks and saucers, which the Ancients abandoned ages ago. You must examine these hulks and collect as much technology from them as possible.

Points are scored from the dismantling of the Ancient's technology. To complicate matters, a hostile race of Guardians patrols the Koronis Rift in saucers, looking for intruders. These Guardians were genetically engineered by the Ancients to protect this world. They also possess the advanced technology and vehicles of their creators. Whenever a Guardian saucer attacks, make quick decisions or you'll become a statistic.

Jermaine: What else can you tell us about this alien technology?

Wilmunder: Each piece of technology is called a module. There are over 100 different modules in **Koronis Rift,** which appear in the forms of powerful weapons and highly advanced devices. This is the interesting part. Each module can be plugged into the control panel of your Surface Rover, but only six modules can be plugged in at any given time. This feature gives the player access to many special abilities.

Some modules are very useful. These include laser weapons, a device which makes your tank hard to find, and a radar detection system that directs you to the nearest hulk. Of course, there are other modules which have little or no value. Some modules even display a sense of humor. For instance, when a certain module is activated, the theme from **Ballblazer** comes up in the control room.

Jermaine: Why did you feature the modules as the main ingredient of **Koronis Rift?**

Wilmunder: The modules are very important for several reasons. First of all, they provide the player with a sense of discovery. Once you've found a module, you're compelled to plug it in and use it, to determine that it can do. Another element generated by the modules is strategy. If you have six really good modules plugged in and discover an excellent one, you have to decide which module to discard. Finally, the real beauty of the design of the module system is the fact that new ideas for modules could be added to the game at any stage in development.

Jermaine: As you begin playing **Koronis Rift,** you start the game in the control room of your mother ship. Who de-

VISTAVISION

Lucasfilm programmers Noah Falstein, Ron Gilbert and Aric Wilmunder.

signed this unique control room?

Falstein: James St. Louis designed the control room. Jim is an artist/programmer who does very good work with shading and multicolored graphics. You can see another example of his work on the load screen of **Rescue on Fractalus!**

Jermaine: What can you tell me about the tank you drive around on the planet surface?

Falstein: For all intents and purposes, the Surface Rover is a real vehicle with power flowing through it. We did some research on the subject of present and future vehicle technology. Because of this, our craft has systems similar to those being used today and those appearing on the drawing boards of tomorrow.

Above the forward view screen of your tank, you see a group of indicators. These indicators operate like those found in an ordinary auto, and are equivalent to a car's speedometer, odometer and fuel gauge. Since your Surface Rover is also a military vehicle, information concerning the present status of your weapons system must constantly be displayed. We decided to create miniature CRT's (televisions) to display the weapons' status, because we know they'll be incorporated into more and more vehicles of the future. Besides that, they were fairly simple to construct, fun to do, and the end result looks great.

Effects like the pictures on the televisions were also easy to accomplish. Regular TV's easily perform these tricks, so it was just a matter of isolating the desired effect to a small section of the screen. The six module interfaces are located below the viewing screen.

Jermaine: From what you've told me, wouldn't you call the tank sequence of **Koronis Rift** a special type of simulator?

Falstein: The primary goal of each Lucasfilm game is to transport the player to a fantasy environment and make him feel as if he's a part of it. Our second goal is to convince you that you're actually participating in a great adventure. We try to generate the same excitement you experience whenever you see a good movie. In the case of **Koronis Rift,** we've created a tank game which exhibits certain simulator characteristics, but our main objective was entertainment.

Jermaine: What can you tell me about the landscape generated by **Koronis Rift?**

Falstein: The surface of the planet Koronis is set up in the form of a linear, predetermined map. This map is composed of a series of mountains and valleys, which occupy 384 bytes of code. We were able to keep the map code small in size, because each mountain or valley is just a one or a zero in the computer. Using various techniques, we also gave each topographical feature on the map its own identity.

Look at one mountain on the map as an example. It's so many feet high, it has a distinctive shape, and may slope off to one side or have a sheer drop. If you travel to other areas of the map and return to this exact location, the mountain will look exactly as you see it now. There is no randomizing. Should you decide to drive around to the opposite side of the mountain, the features of that mountain will appear reversed. These are just some of the bonus features we get almost free when we use the fractal generator to create a landscape.

Jermaine: Will you explain the Surface Rover's shielding and laser system?

Falstein: Both the saucers and your Surface Rover have access to six different colored lasers, while protecting themselves with shields of the same colors. For example, if a red laser is fired at you, you would use a red shield for defense. A blue or purple shield would not be very effective. If you make a mistake using a blue shield to combat a red laser assault, the deadly beam passes easily through your shield. Guardian saucers also have similar problems.

What we haven't discussed is your arsenal of weapons in general. There are a number of modules out there which give you really good lasers and types of weapons that may surprise you.

Jermaine: How have you handled explosions in the game?

Wilmunder: The explosions are set up to be first-person scaling explosions, depending upon what you destroy and how far away the object is. In the past, game programmers have notoriously used the same three to five frames every single time an explosion was needed in one of their programs.

We have come up with several new ways of presenting explosions, while giving the player new capabilities. We try to predict what everybody wants to be able to do in a game, create that feature, and deliver some additional surprises only a few players will discover.

One of the interesting things about our explosions is the fact that they're maintained. They're not just a flash on the screen. As you drive towards the point of the blast, the explosion gets larger. We've also manipulated things so you can destroy something, turn around to face the opposite direction, return to your original position, and witness the completion of the explosion.

When action goes off the screen, it hasn't been forgotten. Everything is realistically maintained. You can shoot a saucer and watch it fall behind a mountain. If you drive your tank around that mountain fast enough, you can witness the final moments of the saucer's explosion. Ef-

Continued on pg. 122

COMMODORE 128 BUYER'S GUIDE

BY TED SALAMONE

A guide to products for the Commodore 128 in 128 mode.

You have a Commodore 128. You're tired of using Commodore 64 software in 64 mode because it doesn't take advantage of the power and flexibility of the 128. The solution? Buy programs created especially for the 128!

I have included all the products for the 128 that were available at the time of this writing. I have arranged word processors, spreadsheets and data bases in charts so you may compare features, and covered the programs not fitting into any one of these categories in the text.

Productivity

Personal Accountant by Softsync takes advantage of the 128's memory, numeric keypad and 80-column display. An accounting program for both the home and small business, it is designed with the financial neophyte in mind. Users fill in the blanks according to on-screen prompts. Novice computerists can set up accounts, complete with entries, an hour after booting the disk. Pros will feel at home even sooner.

Step-by-step instructions for opening accounts, entering data and generating reports are found in the user's guide. Make sure you read the one-page addendum, because it contains updates since the manual was published. The documentation is a mere 22 pages, but it covers every aspect of the program.

Personal Accountant data disks have room for approximately 3,000 entries in up to 144 accounts. If that's not enough, simply transfer balances to another data disk.

All activity takes place within three menu options. Budget, the real heavyweight, is where accounts and entries are made, edited and reviewed. Reports are generated from here as well. Amortization calculates loan payments and forecasts the future value of IRAs, savings accounts, and other assets. Name is a data base that stores addresses and related account information. It sports relatively powerful search-and-sort capabilities.

Built-in accounts include Checking, Savings, Chargecard, Car Loan and Car Repairs, Childcare, Rent, Entertainment, Clothing, Utilities, Food and Income. A special account, Equity, rounds out the list. Of course, you can add or delete from the list at any time.

Because accounts are set according to type (asset, loan, liability), the program automatically double-posts each transaction As long as you properly increase or decrease the first account, the computer correctly posts the others. When deleting or altering a transaction, **Personal Accountant** does not adjust the other accounts automatically. This must be done manually.

Profit/Loss Statements, Trial Balances, Asset/Liability and Expenses can be viewed onscreen or sent to a printer.

Sylvia Porter's Personal Financial Planner 128 by Timeworks lets you take control of your finances. Record and manage your cash, credit cards, checking account and savings account. Customized reports makes you more aware of the relationships between income, expenditures and investments. But for the maximum effect, the program takes a great deal of commitment.

It works with data disks which contain files for transactions, budgeting and asset/liabilities. Separate disks must be created for each category. Initializing them, however, is time-consuming—almost ten minutes for each transaction disk.

All entries are date-stamped according to the data input at start-up. The control data can always be overridden at the item entry point. If disk swapping is necessary, which it usually isn't, the program graphically portrays the one it needs.

Incorrect entries prompt a Help window to appear. For example, a wrong entry within Balance Forward produces information about acceptable entries.

In the budget routine, you can establish projections for the coming year. Real expenditures, as entered into the transaction file, are compared automatically so you can determine actual expenditures versus planned expenditures. In the asset/liability section, you create records relating to all holdings (savings, investments, real estate, collections) or liabilities (student loans, auto loans, mortgage).

Standard reports include balance sheets and income and expense statements. You can also customize your reports.

The user's manual does a fine job of introducing and teaching each function. Enough background is included to make the program useful for those not familiar with accounting or financial analysis procedures.

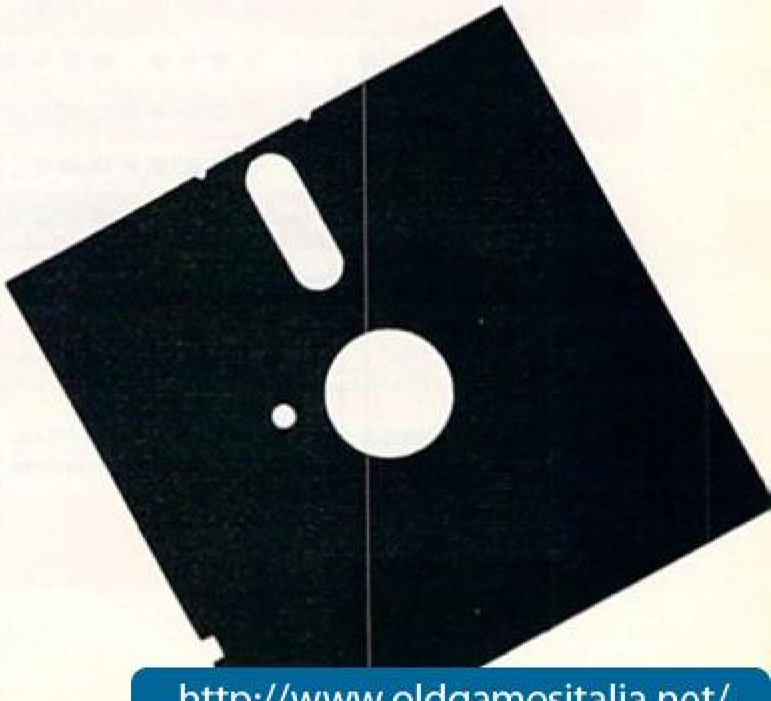
Overall, **Sylvia Porter's Personal Financial Planner** is extremely well done and quite useful. Anyone wanting tighter control over their finances should consider it.

CMS Software has a unique series called the General Accounting system. Modules include **General Ledger, Accounts Receivable** with invoicing, **Accounts Payable** with job costing, and **Payroll.** They are on separate disks with complete back-up utilities. A formatted data disk is also provided.

Sample files help novices gain experience with this business-level product. Both novices and experts alike will make use of the comprehensive user's manual that provides step-by-step instructions. An additional flyer highlights the system's capabilities, as well as providing examples of its many reports and printouts.

General Ledger allows 99 separate debit and credit postings per transaction, contains a cash journal, allows auto-posting from other modules, and controls end-of-month procedures. Financial statements include trial balances, balance sheets, income statements and budget analyses. You can customize them or produce an audit trail of postings.

Accounts Receivable handles invoice entry and billing, posts to **General Ledger,** and sales/cash receipt audit trails. It also prints statements, maintains a tax code file (25 levels), a customer master (with credit limit data), and a sales commission file for up to 99 salespersons. The sales commission file is useful even if you have no sales force. Here you can track the performance of prod-



COMMODORE 128 WORDPROCESSOR FEATURES

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	MOVE	COPY	SEARCH/HUNT/FIND	REPLACE	INSERT	CHARACTERS	WORDS	END OF LINE	LINES	SENTENCE	PARAGRAPHS	RANGE BLOCK	REST	ALL	INDENT	DELETE COLUMN	DELETE PHRASE	TABS HORIZONTAL	TABS VERTICAL	TABS NUMERIC	WORD WRAP	PAGE NUMBERING	CHAIN/LINK DOCS	CENTER	JUSTIFY LEFT	JUSTIFY RIGHT	FORM LETTER MERGE	MACROS (PHRASES)	INTERFACE DATABASE	INTERFACE SPREADSHEET	CALCULATOR	MENU PULL DOWN	MENU POP UP	MENU STANDARD	DOS/DISK COMMANDS	FUNCTION KEYS	HELP	SAMPLE DOCUMENTS	COLOR CHANGE	LINE START/END	PAGE SCREEN UP/DOWN	WORD	PAGE SCREEN TOP	PAGE SCREEN BOTTOM	DOCUMENT START	DOCUMENT END	GOTO LINE #	GOTO SCREEN	SENTENCE	LAST SCREEN	NEXT SCREEN
WORD WRITER	●	●	●	●	●	●	●		●			●	●		●			●			●	●	●	●		●	●		●	●	5	●			●	●	●	●	W	●	●	●	●		●	●					
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COMMODORE 128 SPREADSHEET FEATURES

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SWIFTCALC	17	●	●	●	●	●			20	250	250		●	●	●		●		●	●	●	●	●	●			W		●	●		●		●		●		●	●	●					●	●
SWIFTSHEET	8		●						22	64	254	●			●			●	●	●	●	●			●		W		●	●		●				●									●	●
MULTIPLAN			●			●	●	●	255	63	255	●	●	●	●	●			●	●	●	●			●	●	●		●	●		●				●	●	●	●	●	●	●	●		●	●
JANE				●	●	●				25	50								●	●	●	●								●	●				●	●									●	●

COMMODORE 128 DATABASE FEATURES

							SORTS													SEARCH														CALCULATIONS									MENUS							
	DOS/DRIVE INTERFACE	MAX # OF FIELDS	FIELD LENGTH MAX	MODIFY	ADD	DELETE	ASCENDING	DESCENDING	ALPHABETICAL	NUMERIC	ANY MULTIPLE FIELDS	ICONS	PRINTER CODES	HELP	LABELS	CALCULATED REPORTS	SAVE LABEL FORMATS	SAVE REPORT FORMATS	FIELD INDEPENDENT	EQUAL	>	<	>=	<=	RANGE	NOT EQUAL	PARTIAL MATCH	WILD	AND	ALTERNATIVE	OR	STATISTICAL ANALYSIS	FUNCTION KEYS	CONSTANTS	# OF OPERATIONS	IN FIELDS	IN COLUMNS	CONVERSIONS	SAMPLE FORMS	JOYSTICK	MOUSE	HELP	STANDARD	PULL DOWN	SPEED KEYS	SS INTERFACE	WP INTERFACE	REPEAT LAST COMMAND	# OF SCREENS/RECORD	VARIABLES
DFILE 128	●	[illegible]	1024	●	●	●	●		●	●	●		●		●	●	●	●		●	●	●				●	●						●	●	47	●	●	●					●				●			
JANE	●	15		●	●	●	●		●	●	●	●		●	●		●	●		●							●	●					●						●	●	●	●				●	●		1	
SUPERBASE	●	[illegible]	255	●	●	●	●	●	●	●	●		●	●	●	●	●	●	●	●	●	●			●	●	●	●	●	●	●		●	●	5	●			●			●	●		●		●	●	[illegible]	●
DATA MANAGER	●	100		●	●	●	●	●	●	●	●		●		●	●	●	●		●	●	●	●	●	●	●			●			●	●		5	●			●					●			●		64	
THE CONSULTANT	●	[illegible]	255	●	●	●	●	●	●	●	●	●	●		●	●	●	●		●	●	●	●	●	●	●	●	●	●					●	4	●							●				●		[illegible]	

JANE
Commodore Business Machines

POCKET PLANNER
Digital Solutions

MULTIPLAN
Epyx

SWIFTCALC
Timeworks

SWIFTSHEET
Cosmi

THE CONSULTANT
Batteries Included

DFILE 128
Michaelsoft

DATA MANAGER
Timeworks

JANE
Commodore Business Machines

SUPERBASE
Precision Software

CALCU
COLOR CHANGE ENTRY INDICATES "W" FOR CHANGE WITHIN PROGRAM
SPELLCHECK ENTRY INDICATES SIZE OF DICTIONARY IN 000s
PRINTER TYPES WILL AFFECT ACTUAL OUTPUT

LAST CHARACTER (PREV LINE)	SPELLCHECKER (SIZE)	INCLUDED	MEMORY CHECK	FORMAT TEXT COMMAND	SPEED QUICK KEYS	JOYSTICK	MOUSE	REPEAT LAST COMMAND	MULTISPLIT SCREEN	CALCULATIONS	NEWSPAPER COLUMNS	PRINT FROM LINE #	PRINT ODD/EVEN PAGE	MULTIPLE CURSORS	HYPHEN	HARD SPACE	FORCE PAGE	THESAURUS	MULTILINGUAL	INDEX	TABLE OF CONTENTS	SORT LIST	ICONS	CHAPTERS	TRANSPOSE	PARAGRAPH SPLIT	CONCATENATE	HEADERS	FOOTERS	SUPERSCRIPT	SUBSCRIPT	BOLD	UNDERLINE	SHADOW	ENHANCED (WIDE)	ITALIC	CONDENSED	SEND PRINTER CODES
	85	●	●	●	●			●				●					●											●		●	●	●	●					●
	90	●							●	●						●	●	●								●	●	●	●	●	●	●	●					●
●	30	●		●	●			●	●	●		●	●		●	●	●											●	●	●	●	●	●	●	●		●	●
				●	●	●	●																●							●	●	●	●					
	50	●		●	●			●	●								●	●		●	●			●	●			●	●	●	●	●	●			●		●
	32		●	●						●				●	●		●		●			●						●	●	●	●	●	●			●		●
	30	●	●		●				●	●	●			●	●	●	●											●	●	●	●	●	●	●	●		●	●
●				●													●											●	●			●	●					●
	20	●	●							●					●	●	●		●		●	●						●	●	●	●	●	●			●		●
	100	●		●	●				●	●	●				●		●			●	●							●	●	●	●	●	●					●

MATH FUNCTIONS							OPERATORS												EVALUATION (RECALC)				DATA FORMAT														
COUNT	TRIG	AVERAGE	PRESENT VALUE	FUTURE VALUE	ROOT	MEAN	EQUAL	NOT EQUAL	[illegible]	[illegible]	[illegible]	[illegible]	&	OR	NOT	IF THEN	IF THEN ELSE	IF IF GOTO	HORIZONTAL	VERTICAL	SMART (CIRCULAR REF.)	AUTO	JUSTIFY LEFT	JUSTIFY RIGHT	CENTER	SCIENTIFIC NOTATION	STANDARD DEVIATION	AUTO CURSOR MOVE	DOS DISK INTERFACE	TABS	COPY RELATIVE	COPY FIXED	PRINT FORMULAS	PROGRAMMABLE	MOUSE	JOYSTICK	TEMPLATES/SAMPLE SS
●	●			●	●		●	●	●	●	●	●	●	●	●	●			●	●	●	●		●	●				●	●	●	●					
		●	●	●			●	●	●	●	●	●				●	●				●	●		●	●	●		●	●	●	●	●	●				
●			●		●	●	●							●				●	●	●	●	●	●	●	●		●		●		●	●	●	●			●
●	●	●		●	●		●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●		●	●	●	●	●	●				●
●		●					●															●							●	●	●	●			●	●	●

					FIELD TYPES						
PROGRAMMABLE	MEMO SCREEN	LINK FILES	NUMERIC	DATE	TEXT	CONSTANT	RESULT	CALENDAR	SCREEN DUMP	GRAPHS	PASSWORD
			●		●	●	●				
					●						
●	●	●	●	●	●	●	●	●	●		
			●	●	●		●			●	●
		●	●		●		●		●		●

SUPERSCRIPT Precision Software	**PAPERCLIP** Batteries Included
FLEET SYSTEM 3 Professional Software	**JANE WRITE** Commodore Business Machines
PERFECT WRITER Commodore Business Machines	**VIZAWRITE** Solid State Software
POCKET WRITER Digital Solutions	**WORDFILE** Michaelsoft
WORD WRITE Timeworks	**WORDPRO** Pro-Line Software

ucts, stores, regions or product groups. Other reports include customer activity and open invoices.

Accounts Payable performs invoice entry and payment, maintaining a complete check registry in the process. Journals include **General Ledger** postings and purchases. Costs may be distributed to as many as 15 different jobs at entry time. Estimated cost, cost-to-date and a detailed purchase record are produced in this submodule which can operate independently of **Accounts Payable.**

A standard vendor file is maintained and updated automatically. Reports include job activity, a job list, check register and an open-invoice listing.

Payroll calculates wages, prints checks, posts entries and even has a provision for manually written checks. It handles weekly, bi-weekly, semi-monthly and monthly employees in the same run. Full employee and transaction information is maintained, and up to seven miscellaneous payment/deductions may be entered per employee.

The basic file holds pay period, federal and state tax number data, and overtime rates. Quarterly tax reports can be issued, W-2's printed and federal tax parameters (withholding rates, FICA rates and cutoff amount, standard deduction) set.

Reports include a payroll journal, quarterly tax totals, a payroll check register, and deduction/miscellaneous payments. Decimal points are automatically entered, there is a sample chart of accounts, and zeroes are automatically filled in account and amount fields.

Unfortunately, there is no report generator in General Ledger. You also must always quit from the main menu. Other than these limitations, the CMS Accounting System is quite useful.

Chartpak-128 from Abacus goes beyond the normal realm of business software. **Chartpak** produces customized charts and graphs, including pie, horizontal bar, 3D horizontal bar, and their vertical counterparts. X/Y and comparison plots can also be created. All can use different label fonts, multiple label locations, several types of fill, and dotted, solid or crosshatched lines.

You have complete control over both axes: their origins, colors and titles. Set the X and Y axes to different colors (16 available), co-

> **BASIC 128** *is designed to make P-code run up to 1500% faster than uncompiled code, and machine code runs up to 3500% faster.*

ordinate the labels, and include up to six lines of notes on each. Retain the default scale, adjust manually or select a logarithmic scale. **Chartpak** even makes it easy to display or print only a portion of a chart or graph.

In addition to direct keyboard input of data, the program accepts DIF, SYLK or Busicalc 1 formatted data. DIF file-reading routines and file-conversion routines for the other formats are provided.

The on-screen graphics are unexpectedly crisp and clear. Each illustration actually comprises four screens. Chartmakers scroll through each quadrants to view details, jumping between quadrants with just a keystroke. An overview of the entire diagram is possible, but you lose color and detail in the process.

Chartpak accepts up to 800 points of information per chart. These can be further divided into four data sets. Both the customized form and the data contents of diagrams are stored for later recall in separate files.

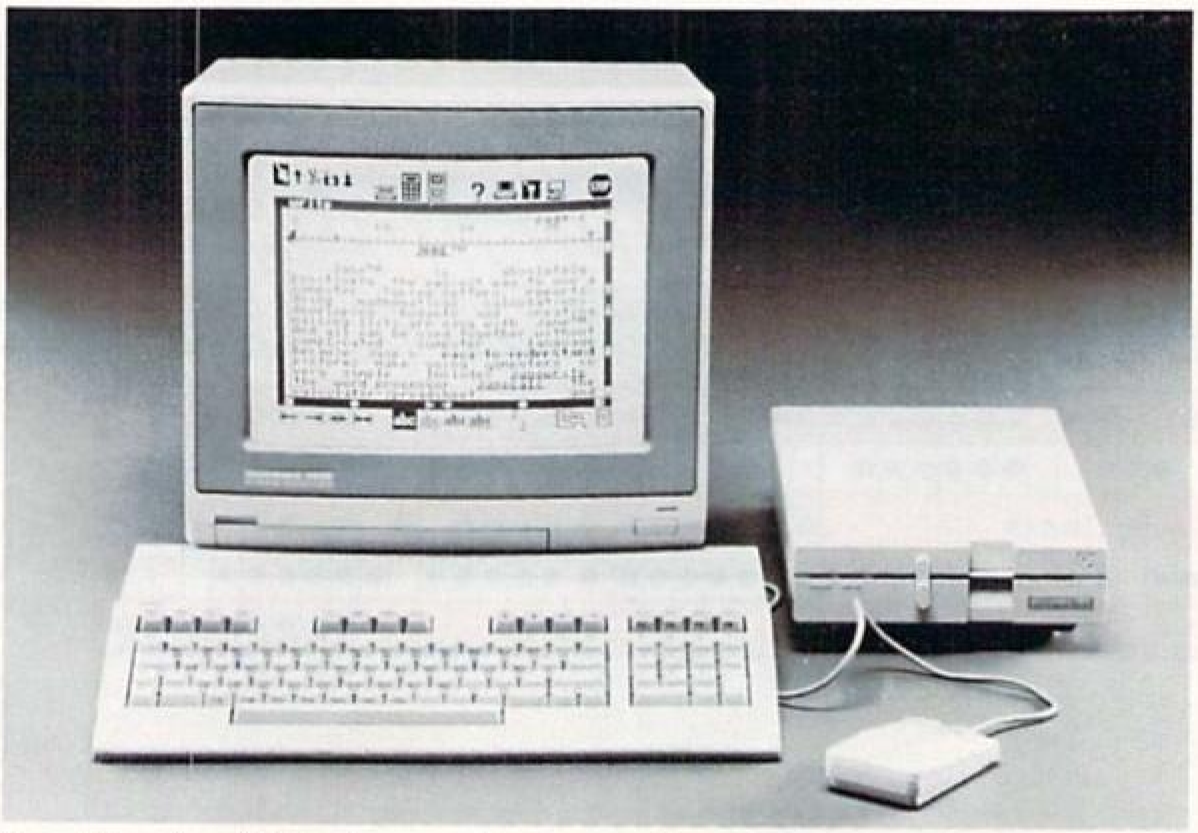
Data can be grouped, manipulated mathematically (within sets), or averaged. Statistical capabilities include calculation of standard deviations, least squares, and exponential smoothing. Data can also be moved or copied. Entire sets can be cleared with one command, and you can alter individual points within the sets any time.

A number of standard printers and interfaces are supported, color output included. Most print routines permit choice of type size as well as font. **Chartpak** even works with a 1526 printer.

The user's manual is comprehensive. It includes tutorials, reference sections and appendices. Numerous demonstration charts and data files are included on the program disk.

However, one error did crop up that should have been caught by the program. While manipulating some data sets, division by zero was performed. Instead of an error message, the program bombed out to BASIC. All the data was lost.

These last three products I didn't get a look at because they were not completed at press time. Michaelsoft has released **Spellfile 128,** a spellchecker designed to work in conjunction with **Wordfile 128.** It also works with any word processor that uses sequential files. It contains over 24,000 words in 1541 SS format and over 40,000 in 1571 DS format. It works with 80-column monitors on files up to 600 lines long. Commonly used words are stored in memory, and the dictionary can be revised and updated.



Batteries Included's **Paperclip II** features built-in telecommunications, a 30,000-word spellchecker, macros, multiple columns, reverse video scroll, and chaptering. It is completely compatible with previous 64/128 **Paperclip** files.

Homepak 128, also from Batteries Included, provides telecommunications, word processing and database management in an integrated stand-alone environment.

Utilities

Following up on their earlier success with **MACH 5** for the Commodore 64, Access Software has released **MACH 128,** a cartridge/disk combination. The cartridge provides MACH DOS, a two-keystroke override of Commodore DOS. The disk adds 4K RAM to 64-mode BASIC and manages files by cataloging programs and data disks.

Residing in the 128's expansion port, the cartridge lists disk directories, issues DOS commands to drives, sends commands to printers, and loads and executes programs. Other functions include hardcopy printout of screens, auto-load and run applications, high-speed loading, and a 1541 disk format option. Programmers can also do conversions of hex, decimal and binary. MACH DOS can always be disabled if it interferes with normal operation of a program.

Unlike standard cartridges, this one has a switch for 64 or 128 mode and a reset button built in, which works just like the one on the 64.

The 4K RAM memory added does cause a few restrictions to BASIC command access, and even though the disk organizer works only in 64 mode (something not clearly identified in the manual), it does read both sides of 1571 formatted drives.

Not all applications work with **MACH 128.** Timeworks' **Financial Planner** and **Swiftcalc** would not boot with **MACH 128** installed. **Multiplan** by Epyx also wouldn't boot. Then, of course, the **Vizawrite** cartridge is out of the question.

BASIC 128 from Abacus is a BASIC compiler/development system that produces P-code as well as machine-language code. It is designed to make P-code run up to 1500% faster than uncompiled code, and machine

Micro Illustrator *lets you include your materpieces in your BASIC programs.*

code runs up to 3500% faster.

Features include variable code-start address, flexible memory usage (depending on program size, from 60K to 100K is free), floating point auto-link or disable, calculation of constants and strings during compilation and syntax checking. Other features include error warnings, compiler restart with cold reboot, line-address listing, formula transposition and optimization, and redefinition of variable data types.

BASIC 128 is menu-driven and extremely easy to use. Minutes after I booted it up, I ran a 600-line BASIC program through it. Once the reported error was fixed and the program recompiled, it ran like a jackrabbit.

For advanced development, default compiler settings are changed by direct command. The 128's fast mode is addressable, high-resolution on the 80-column screen. A stand-alone module contains everything to execute compiled programs. It works with the 1541 and 1571 drives.

Miscellaneous

Micro Illustrator unleashes the artist in all of us. Choose between keyboard, joystick or mouse. Flip between six canvasses, and even include your masterpieces in your BASIC programs. Pick from three variations of 16 colors each: solids, transparent and non-transparent. Choose from ten brush sizes and styles and nine speeds of brush movement.

Keyboard commands control the four fonts, dump pictures to a printer (black and white only), or make a slide show with the six canvasses. Icons display your options of drawing freehand, and using lines, kinked lines, rays or points. You can also fill areas, make frames (hollow boxes), boxes, and circles. Multiple icons can be used simultaneously. Special functions make it easy to copy all or part of an illustration, magnify sections for detailed work, produce four-quadrant mirror images, and erase all or part of a drawing. The magnify mode is magnificent, great control of every pixel.

Brainstorm 128 by Country Road Software is one of the most unique programs for the 128. It is an idea processor; a tool to generally focus and better organize your thoughts. A full-fledged word processor is included.

Within **Brainstorm 128,** you list ideas and establish relationships by selecting menu options. Ideas can then be reordered and compared. Up to four levels of branching are accommodated. Priorities are established in one of five categories: general to specific, specific to general, most to least important, chronological and spatial.

A paralleling process streamlines your writing. For instance, this option lets you make sure tenses are the same.

The program is menu- and command key-driven. By pressing the first letter of a command, you can add, delete or rearrange items, reword items, designate the number of levels active, create a thesis (summary), or view the buffer of items deleted (buffered items can be restored).

F1 accesses the Brainstorm mode; F2 introduces the Automatic Pilot, a feature that guides you through the program; F3 displays outlines on-screen; F4 produces hardcopies, F5 loads outlines; F6 saves them; F7 drops you into the word processor; and F8 reactivates the BASIC mode.

The manual guides you through the entire process, and on-line help provides insight into the workings of the program. At $19.95, you can't go wrong.

John Mihalik, under the Mikoware label, has produced the first true 128 entertainment program, **35 Amazing Games for Your Commodore 128.** This compilation is actually educational, because it teaches programming techniques and displays the 128's capabilities.

Crude by normal commercial game standards, the games include Mind Reader, Shooting Gallery, Biorhythms and Bomb Squad. Two versions are available: modifiable and compiled BASIC. An illustrated paperback, available separately from HP Books (P.O. Box 5367, Tucson, AZ 85703), lists the programs and provides useful tips.

Turn Your Composite Monitor into an RGB

Microvations, a cable and interface producer, has released a great product for Commodore 128 users who don't have an RGB monitor. A simple cable with a toggle switch turns composite monitors like the Commodore 1702 into a high-resolution monochrome machine capable of generating extremely legible text. Installation is straightforward, taking a matter of minutes, and lets you switch between 40-column output (for 64 or 128 mode), and true 80-column mode for the 128. This entire article was done using a monitor equipped with this device, and it worked very well.

Companies

Abacus Software
P.O. Box 7211
Grand Rapids, MI 49510
616-241-5510

Access Software
2561 South 1560 West
Woods Cross, UT 84087
201-973-0123

Batteries Included
30 Mural Street
Richmond Hill, Ontario
L4B 1B5 Canada
416-881-9941

CMS Software Systems
2204 Camp David
Mesquite, TX 75149
214-289-0677

Commodore Business Machines
1200 Wilson Drive
West Chester, PA 19380
215-431-9100

Cosmi
415 North Figueroa Street
Wilmington, CA 90744
213-835-9687

Country Road Software
70824 C.R. 143
Ligonier, IN 46767
219-894-7278

Digital Solutions
P.O. Box 345 Station A
Willowdale, Ontario
M2N 5S9 Canada
416-221-3225

Epyx
1043 Kiel Court
Sunnydale, CA 94089
408-745-0700

Michaelsoft
4821 Harvest Court
Colorado Springs, CO 80917
303-596-4243

Microvations
5333 Mission Center Road, Suite 345
San Diego, CA 92108
619-291-2722

Miko Ware
P.O. Box 95759
Seattle, WA 98145-2759

Precision Software
c/o Progressive Peripherals & Software
464 Kalamath
Denver, CO 80204
303-825-4144

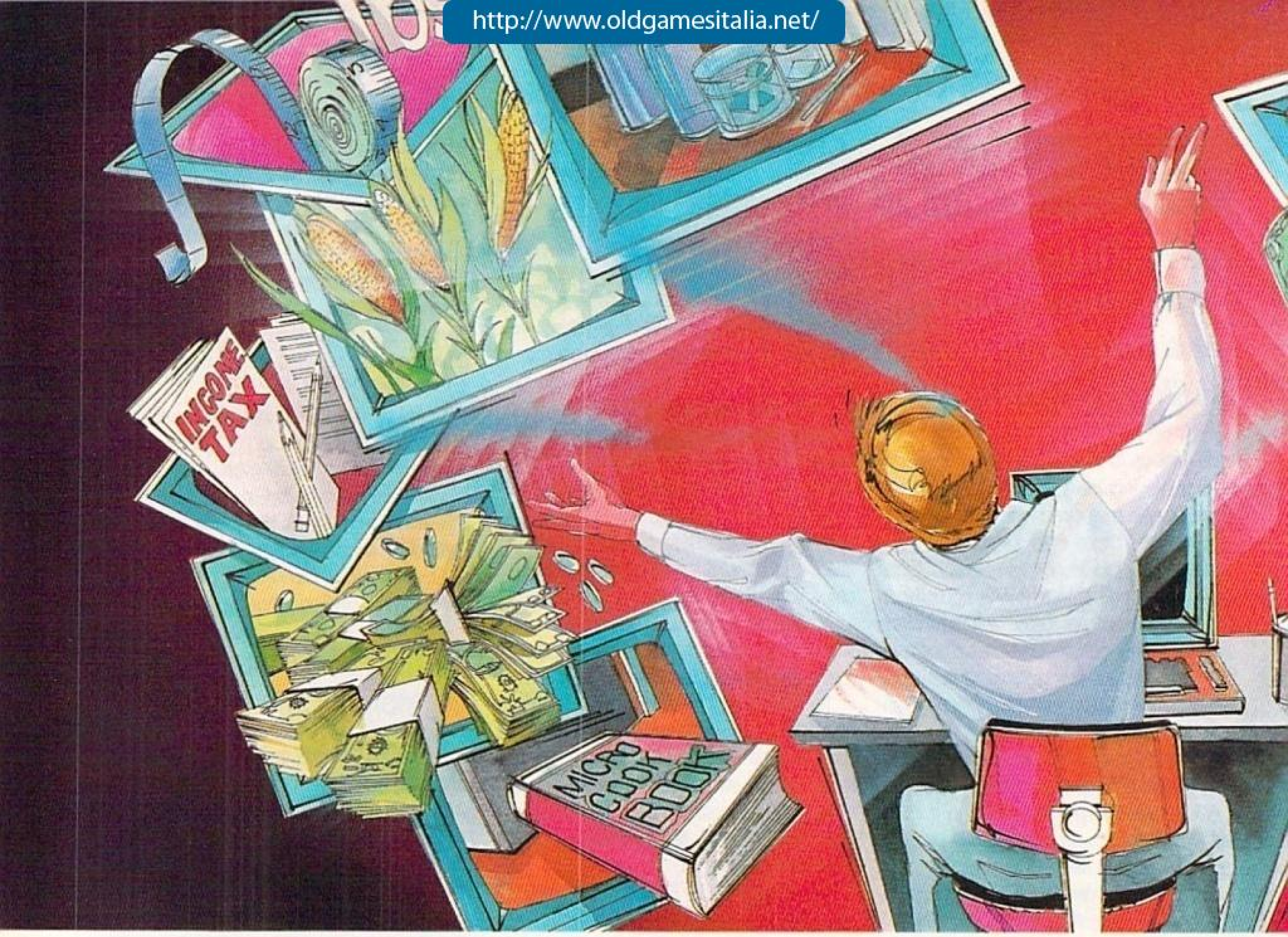
Pro-Line Software
755 Queensway E Unit 8
Mississauga, Ontario L4Y 4C5 Canada
416-273-6350

Professional Software
51 Fremont Street
Needham, MA 02194
617-444-5224

Softsync
162 Madison Avenue
New York, NY 10016
212-685-2080

Solid State Software
1125 E. Hillsdale Blvd., Suite 104
Foster City, CA 94404
415-341-5606

Timeworks
444 Lake Cook Road
Deerfield, IL 60015
312-948-9200



The World of Weirdware

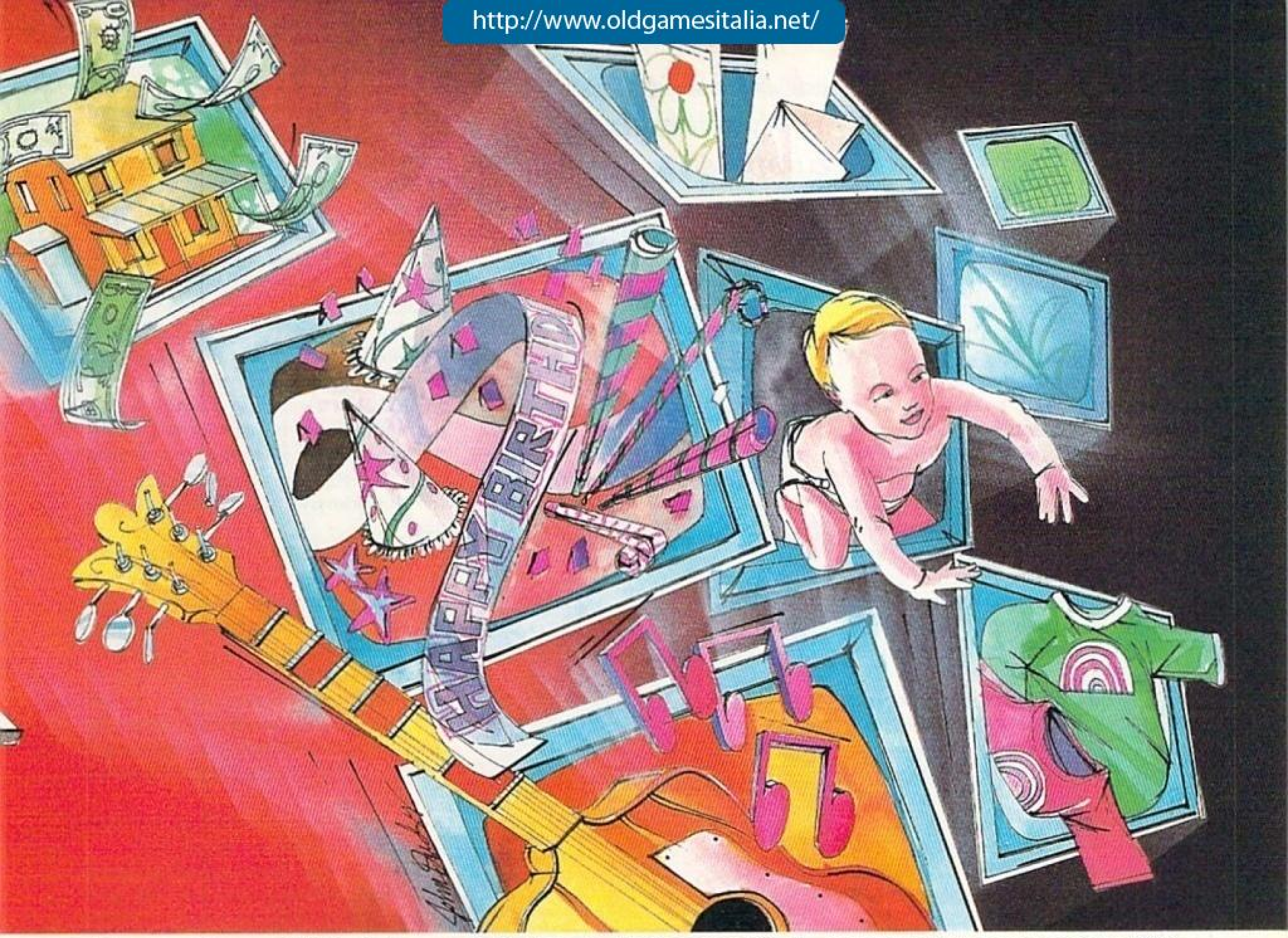
I Didn't Know You Could Do That *with a Computer!*

I have had it. I am sick and tired of hearing people say there is nothing useful that can be done with a home computer. So I'm not going to take it any more. I'm going to show you how you can use a computer from the day you are born until the day you die. All the programs mentioned in this article are available for the Commodore 64.

BY DAN GUTMAN

On the day you are born, your parents should have a copy of **Childpace** (Early Development Resources), which helps parents determine how their new baby is progressing physically and mentally. Today would also be the perfect day to enter your name into Quinsept's **Family Roots**, a genealogy program that keeps track of your family tree.

You are probably an adorable child, but you complain, pout, and rebel against your parents. If they are smart, they'd check out **Mind Over Minors** by Human Edge Software. By analyzing the personalities of parent and child, it helps the parent identify strengths and weaknesses,



and improve the parent/child relationship.

Assuming you turn out okay, mom and dad start throwing you birthday parties. With **PartyWare** from Hi Tech Expressions, you can print out banners, party hats, place mats, place cards, party games, invitations, and thank-you notes. You can even maintain a data base of 60 friends, so it will be easier to throw next year's party.

Enough of this kid stuff. You're growing up fast. You probably play your share of computer games and use a lot of educational software over these years. Before you take the dreaded Scholastic Aptitude Test, you should practice for it on your computer. There are dozens of SAT programs to choose from, as well as one for the ACT, LSAT, and most other standardized tests.

You can even go to college with your computer. Telelearning's **The Electronic University** offers certified BA, MBA, and graduate degrees at more than 1,800 colleges (including the University of Guam). You take your classes at home by telecommunicating with your professors.

Sad but true, after graduation you'll probably have to abandon your life of parties and good times to find a job. No sweat! CompuJob Software's **Jobfinder** series will help you evaluate your job potential, prepare for interviews, write your resume, cover letter, and follow-up letter.

It seems like just a few minutes ago you were born, and now you're a full-grown adult. Sticking with the good old American dream, after you get your first job you'll probably get your first house. Here's where a computer can really come in handy.

Unless you're independently wealthy, you'll be getting a mortgage from the bank. You need Navic Software's **Mortgage Maker**! You just tell the computer your down payment, how much you're planning to borrow, the length of the mortgage, and the current rate of interest. In about a millisecond, **Mortgage Maker** will tell you how much your monthly payments will be. Naturally, you can change all the numbers around and work out the best arrangement for your needs.

After you get approved for your mortgage and move in, you might want to hook up the **X-10 Powerhouse** home control device to your computer. While you're driving home from work, **X-10** will start cooking your dinner, and turn on your driveway lights and air conditioner. If somebody breaks in while you're away, it will sound an alarm. And it won't run up your electric bills too much, especially if you hook up Jance's **The Reduce System**. It can knock back your bills as much as 30% by programming your thermostat and hot water heater to turn on when the rates are lowest.

Ah, the great outdoors! Breathe in that air! With all that property surrounding your computer-controlled house, why not plant a garden? It's a snap with Home and Hobby Software's **Plantin' Pal**. This program will help you lay out your garden, choose what to plant according to your family size, and tell you when to water, fertilize, or spray insecticide.

Naturally, you'll have a bumper crop of fruits and veggies. Bring that stuff into the kitchen and boot up **Micro Cookbook** by Commodore Business Machines. It contains over 150 recipes, which can be selected by name, ingredient, or category of food. You can even tell the computer tell the computer all the food you harvested and it will tell you which recipes use those ingredients. Many critics think computerized recipe cards are just about the dumbest thing you can do with a computer, but somebody must be using them—over 100,000 copies of this program have been sold.

As a mature, home-owning money earner, you've got other things to think about besides growing broccoli. Like income taxes. Yes, you can do them on your computer too. **J. K. Lasser's Your Income Tax** by Simon & Schuster is one of dozens of programs that pull all the forms you need right on-screen. You just fill in the numbers and the computer does the calculations. You say you don't like those numbers? Then plug in different numbers and see how it changes your tax situation. Remember, fiddling with your taxes is illegal, but fiddling with your computerized tax return is perfectly okay.

Does all this talk about taxes make you feel old? Well, you **are** old now, and there are new things occupying your mind. Like retirement, and insurance. Drag out the old "useless" computer again. Programs like **Get Rich: Insurance Planning** (Arrays) and **Retirement Planning** (Advanced Financial Planning) are just what you need. These programs will analyze your financial situation and tell you how much you have to sock away in order to be comfortable for the rest of your life.

Which brings us to the end, in more ways than one. Yes, it's a drag to talk about it and all, but someday the earth will still be rotating without any assistance from you. When you're good, it will make things a lot easier on your family if you have a legal will and testament. Surprise! You can do one on your computer and save thousands of dollars in lawyers' fees.

WillWriter by Nolo Press helps you write and print out a perfectly legal will literally in minutes. Do you want to leave your eight-foot ball of twine to your sister? Type it in and she'll be sure to get it. The best part is that if somebody in your family gets on your nerves one day, you can easily cut him or her out of your will with a few keystrokes. That's one way to keep your relatives on their toes.

So **there**. Anyone who says computers have no place in the American home is full of it! I have proven that you can get good use out of a computer from the moment you're born until the day you die. Even **after** you die, for that matter.

Many critics think computerized recipe cards are just about the dumbest thing you can do with a computer, but somebody must be using them—over 100,000 copies of this program have been sold.

The Weirdware Revolution

There are hundreds of these programs. They're not games. They're not educational. They're not business programs. They're different from anything else out there. They're weird. That's why I call this stuff "weirdware." And it's weirdware that's going to make this so-called computer revolution more than a handy buzzword.

For some people, these applications may seem trivial compared to spreadsheets, data bases, and other more traditional software. But for those of us who aren't corporate executives, preparing for the SAT test and planting a garden are a lot closer to home than managing a company's finances. To me, weirdware is far more interesting than "integrated software" or "relational data bases."

The programs I've mentioned here are the things that the average guy in the street would want to do with a computer. But we never hear about these programs because they usually come from Mom and Pop software companies working on kitchen tables, and they don't have national distribution or big advertising budgets.

It's time for the home computer manufacturers to face the truth—word processing is essentially boring. Data bases are dull. When someone corners you at a party and starts talking about spreadsheets, you know it's time to refresh your drink. If computers are so exciting, why are the primary uses for them such a drag?

All those weirdware programs I mentioned don't even scratch the surface. If you're a gambler, there are programs that will help you win at blackjack, handicap NFL games or bet on the horses. If you're religious, you can use the computer to learn the Bible or study for your Bar Mitzvah. If you're a visionary, there are programs that will chart your horoscope, calculate your biorhythms, or consult the **I Ching**.

The computer, obviously, is multi-talented. The possibilities are endless.

If health and fitness is important to you, there are programs that will give you an aerobic workout, build your muscles, help you quit smoking, or design a jogging routine. You can even go on a diet with your computer and a program like Scarborough's **The Original Boston Computer Diet**.

Or maybe it's your **mental** health that needs some work, You don't have to pay a shrink $75 an hour. There are software packages that will give you an I.Q. test, analyze your personality, improve your memory, or even help you hypnotize yourself (Psycom Software's The **Hypnotist**). Your computer will even analyze your sex life with the help of IntraCorp's **IntraCourse**, which is endorsed by Dr. Joyce Brothers.

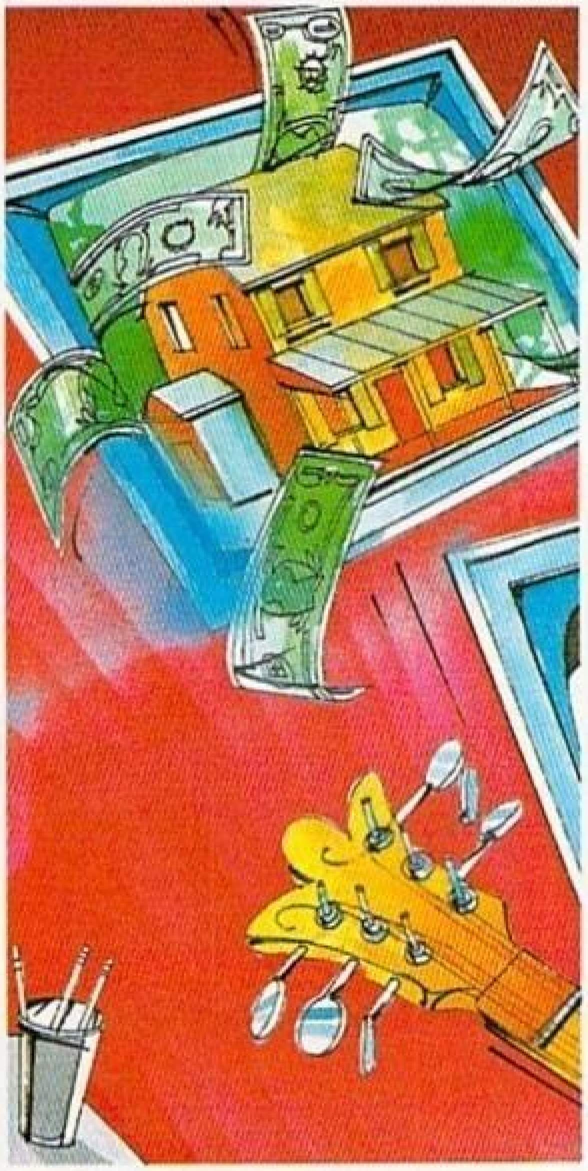
If you've got a hobby, there is almost certainly a computer program that will help you enjoy it more. The computer can keep track of everyone's average in your bowling league, or all the statistics of your favorite baseball team. You can build a robot, design a crossword puzzle, or learn how to drive a car.

Everybody knows you can organize your coin or stamp collection on computer. How many people know about the **Mr. Boston Official Micro Bartender's Guide** (Concept Development Associates)? Keep your Lotus 1-2-3. I get a lot more use out of Simon & Schuster's **The Great International Paper Airplane Construction Set.**

If you're in the arts, the computer can be an expression of your creativity. Most people are familiar with programs that help you create music or drawings. There are also programs that help you play guitar, create your own cartoons, comic strips, rock videos, and greeting cards. With the **Underware Colorpack** from Diversions, you can even print up your own T-shirt iron-ons.

You don't have to be a programmer or a genius to do these things. You can pop these disks in your drive and crank them up. And I haven't even mentioned telecommunications! Once you hook up your computer over telephone lines to other computers, there's another million or so interesting things you can do.

These programs will analyze your financial situation and tell you how much you have to sock away in order to be comfortable for the rest of your life.



Are You Dishwasher Literate?

Nevertheless, we hear the same question over and over: "Who needs a personal computer?" I'll tell you who. Nobody! But then, nobody needs a microwave oven. Nobody needs a food processor. Nobody needs a telephone answering machine. We got along fine before these products were invented. What's the big fuss about computers? What makes a computer different from an appliance like, say, a dishwasher?

Here's my theory—Nobody ever put a dishwasher on the cover of Time magazine and named it "Machine of the Year." Nobody ever said dishwashers were the wave of the future. We never saw commercials scaring us into thinking our kids would be left back in school if they weren't "dishwasher literate."

Dishwashers never received the hype of computers. And because of that, nobody was ever disappointed by a dishwasher. We never see quotes in the newspapers like, "There is no place in the American home for a dishwasher," or, "What can anyone do with a dishwasher?"

It's ironic that people don't know what they can do with a computer, when the computer is the **only** appliance that can do more than one thing. Even if it **were** limited to word processing, spreadsheets and games, that's already three times as many things as other appliances can do. Toasters can do one thing—toast. Refrigerators can do one thing—keep food cold. Dishwashers can do one thing—wash dishes. That's all these appliances do, and most people have been pretty satisfied with that arrangement. One appliance—one task.

But the computer—by its very nature—can do **hundreds** of tasks. That's its strength, and that's also its disadvantage. Unlike a dishwasher, the computer doesn't have a **specific well-defined purpose**. It can do so many things, people don't know **what** they can do with it.

It's not that there's nothing we can do with a computer—it's that we can do too much! Someday, hopefully, these programs I've been calling "weirdware" won't be considered weird at all.

Dan Gutman's new book, I Didn't Know You Could Do That with a Computer! *(Compute! Books) describes hundreds of practical and unusual software packages you can buy. If it's not in your local bookstore or computer store, ask them to order it for you.*

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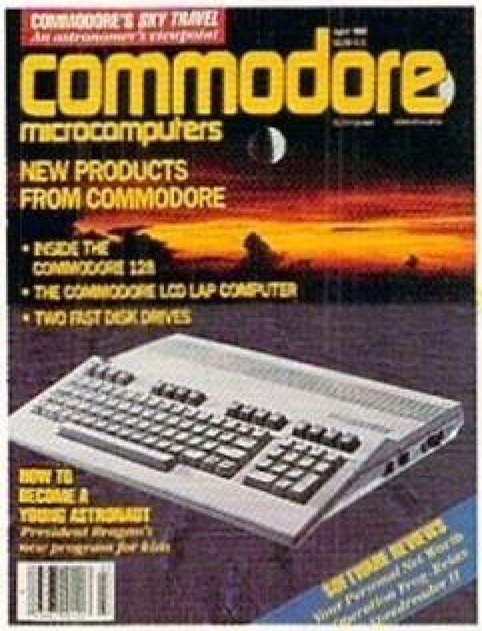
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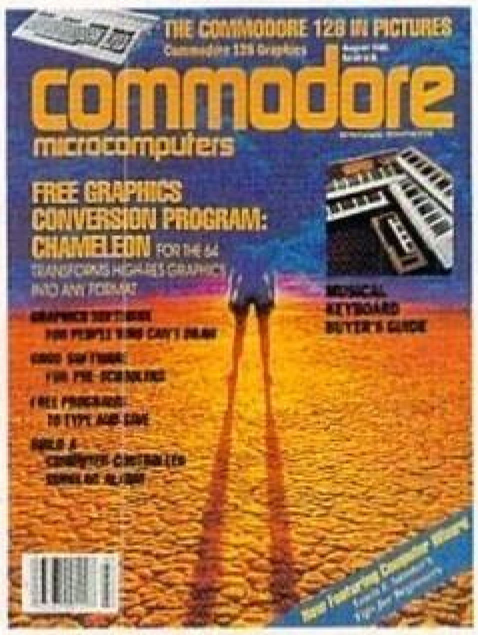
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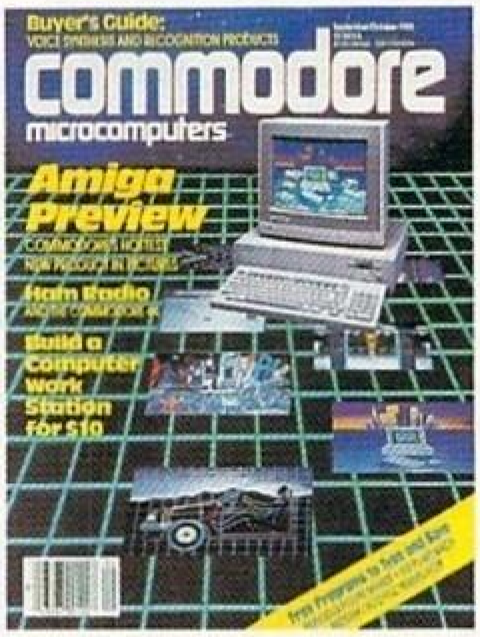
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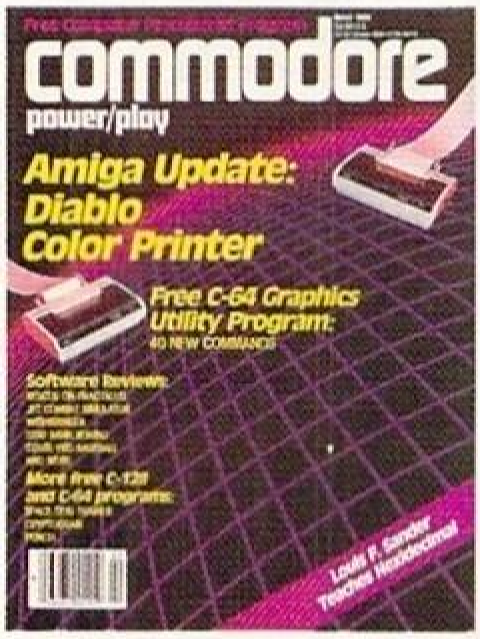
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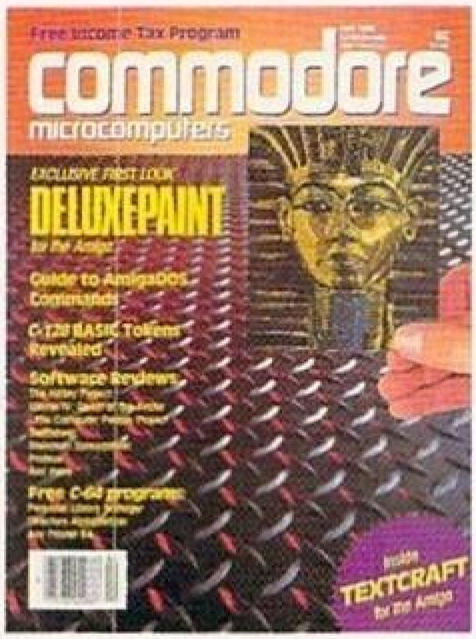
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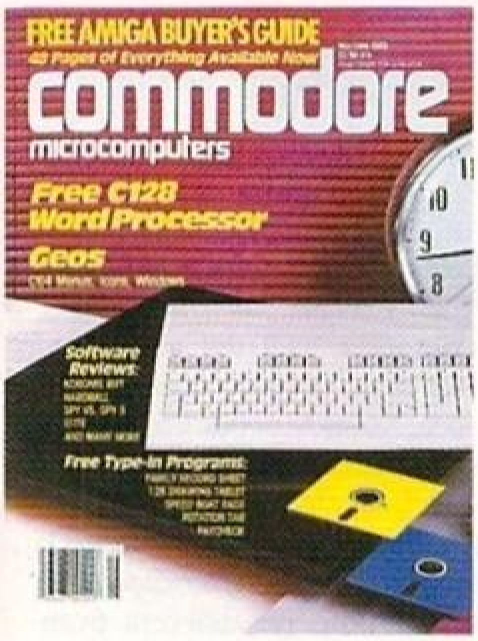
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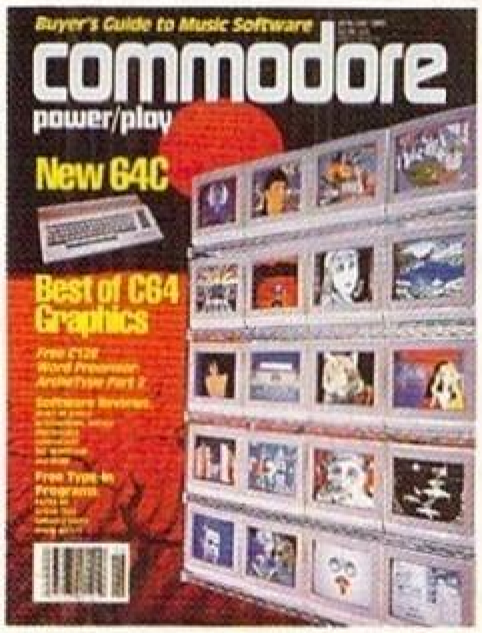
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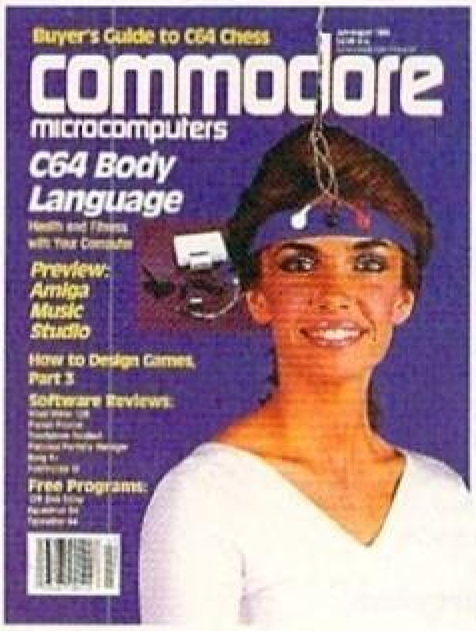
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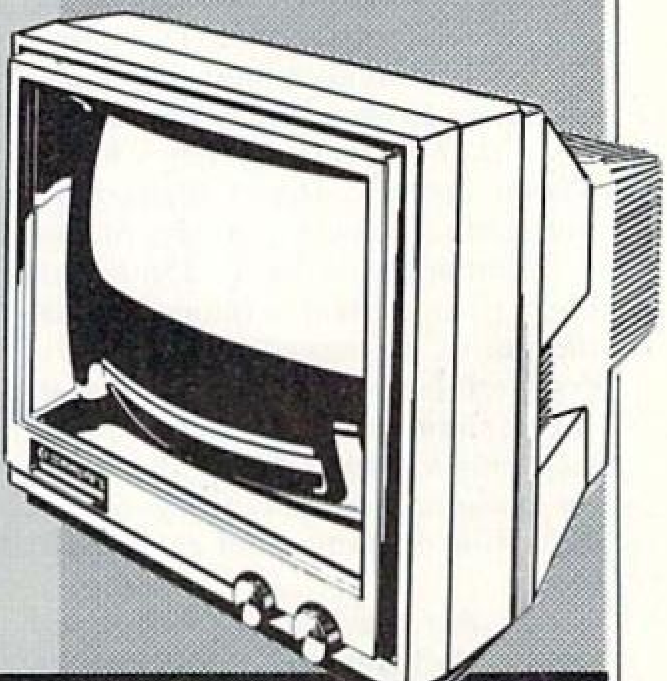
BY MATTHEW LEEDS

All About Monitors

To choose the best monitor for your computer system, you should understand these basic facts.

There are many kinds of monitors on the market: monochrome, color, composite video, RGB, hi-resolution, ultra hi-resolution, digital, analog, and a few others still being designed, but coming soon to a theater near you. If you are planning to buy a monitor, you may be uncertain which one is the best for you.

A few monochrome monitors use high-persistence phosphors to compensate for slow screen updating. This can cause "cometing"—streaking of the characters when the display scrolls.



In general, the answer to that question depends on what you plan to use it for. If your only need is for word processing, for instance, then a monochrome monitor might be best. But perhaps you plan to timeshare the use of your new acquisition between the computer and the family's VCR. In that case, one of the new multiple-input monitors would be best for you.

The process of deciding which monitor to purchase can be a difficult one, because the specifications for monitors are often confusing, and so far there are no industry standards for specification sheets. Terms like dot pitch, bandwidth, convergence, and resolution can be misleading if you don't have a basic understanding of what they mean.

Composite vs. RGB

The least expensive monitors use composite video (NTSC video). This is the same kind of signal a VCR produces, so this type of monitor can serve double duty as both a computer display and a VCR screen. However, color composite monitors generally cannot display more than 40 characters on a line in an easily readable manner.

On the other hand, even though monochrome monitors also produce composite video, they display 80 characters per line very well. The reason for this discrepancy is easy to understand. A monochrome monitor uses only one phosphor dot on the screen to create one picture dot, or pixel. However, to display color, a monitor uses groups of three phosphor dots (one each for red, green and blue) to create each pixel. This means that a pixel used for monochrome is much smaller than a pixel used for color. As a result, the resolution of a monochrome screen is much finer than that of a color screen, so the smaller characters of an 80-column display are sharp enough to be read.

More expensive monitors use a system called RGB, so called because phosphor triads in a color display are composed of red, green, and blue dots. In composite video, the video signal is mixed in the computer, sent to the monitor, and then separated to drive the electron gun that triggers each different color in the triad. In the RGB system, each color signal is kept separate, and sent on its own. By eliminating the mixing and unmixing of the signal, a much cleaner display can be produced.

There are two types of RGB: digital and analog. Digital RGB generally can display only 16 colors, while analog RGB can deliver 4,096 colors. The reason for this difference is simple to understand. In an RGB digital monitor, each of the three color guns is either on or off, which results in eight possible combinations for creating color. In addition, all three can be either fully on or half on, which results in a total of 16 different possible combinations for creating colors. Each of the three guns in an RGB analog monitor, on the other hand, can be at any of a number of different levels of intensity—usually each gun has 16 levels. The result is 4,096 possible combinations for creating colors.

Resolution, Dot Pitch and Other Screen Features

Screen resolution is a measure of how much information can be displayed on the screen. It is sometimes measured in lines, and sometimes in pixels (picture elements or dots). In most instances there is no significant difference in the use of either term since it really doesn't matter whether you are counting a row of points or a row of lines. Generally, however, the specs will be expressed in pixels, with the horizontal resolution first (e.g., 640 (horizontal) x 200 (vertical)). The actual display is determined by your computer, so there is little advantage to paying additional money for a monitor that can display more lines than your computer can generate. Conversely, if your computer can create super high-resolution, you want to take full advantage of its capabilities, and not waste all that power on a less-than-adequate CRT.

Dot pitch is a measure of the distance between individual phosphor dots on the monitor's screen. The smaller this number, the better the resolution of the monitor. TV's have a dot pitch around .80mm or so, and most composite video monitors get close to .60mm. Dot pitches below .40mm are considered high-resolution, and some manufacturers market RGB monitors with a .25mm dot pitch. It's important to remember that the size of the screen relative to the dot pitch helps determine the apparent resolution of the monitor. A nine-inch monitor with .25mm dot pitch, for example, looks about as good as a 12-inch with .31mm, but costs much more.

You also see a lot of talk about bandwidth. Bandwidth is a measure of the speed at which a monitor receives and displays information. The higher the bandwidth, the faster the information is displayed, and the higher the resolution the monitor can therefore support. If you want numbers, TV's generally have bandwidths up to 4.5 MHz, composite video monitors are about the same, RGB monitors start around 10-15 MHz, and exotic-use designs can handle bandwidths of over 50 MHz. Of course, there is no use in spending extra money on a monitor with high bandwidth capabilities if your computer doesn't generate that kind of resolution.

Convergence and chromatic aberration are of particular concern on color monitors. Chromatic aberration results when the electron beam's focus is off a little bit because of the shape of the CRT screen. In a color monitor, there are usually three electron beams focused to strike the phosphor triads at just the right point. Geometry dictates that the locus of their focus is a hemisphere. However, the screen is flatter than the curve of the hemisphere. This causes the beams to sometimes be out of focus, causing a blurry image. Also the unfocused beams may strike the wrong dots, causing "off" colors.

Misconvergence results when the shadow mask is not lined up properly with the phosphor triads in the CRT. (A shadow mask is a screen-sized piece of metal, perforated in alignment with the phosphor triads. It is positioned so that each electron beam can strike only its own phosphor dot in the triad. Misconvergence results in color fringing. It is usually measured in fractions of a millimeter, and two figures are given—one for the center of the screen and one for the corners. Typical numbers for the corners start at .8mm and the center can range from .3mm on a sharp screen to .75mm or worse.

Screen size is another factor to consider. Nine inches is the minimum I recommend unless you have special needs. The most popular seems to be 12 to 13 inches. Remember, the screen size is one element in the apparent resolution. Compare monitors of similar sizes.

All of these factors combine to create the apparent screen resolution for any given combination of computer and monitor. But studying a spec sheet can only give you a starting point in deciding which monitor to purchase. I highly recommend either purchasing your monitor from a dealer who will allow you to return it if you are not happy with it, or bringing your computer system to the dealer's store (if he does not carry it in stock) to try out the display. It is difficult to predict which monitor will give you the best results, if the specs are close among several brands.

Other Considerations

If you are looking for a monochrome monitor, there are several colors to consider: amber, green, or black and white. Some monochrome monitors have a "reverse" switch that lets you display dark characters on a light screen if you prefer. Many monochrome and some color monitors do not have speakers. A few use high-persistence phosphors to compensate for slow screen updating. This can cause "cometing"—streaking of the characters when the display scrolls. Some people find this annoying.

The placement and variety of controls should also be a concern in buying a monitor. Can you easily adjust the contrast and brightness? How about the horizontal and vertical position? Color controls and volume? Can you adjust the vertical size of the image?

Some color composite video monitors have separate luminance and chroma inputs to take advantage of a computer's separated video signal. This can give a much cleaner display. Others have a "green switch" that turns off two of the electron guns, and gives the same effect as a monochrome monitor. Be sure to check what kind of connectors your prospective monitor has. Some RGB digital monitors have very strange video sockets.

A few monitors come on a tilt-and-swivel base. This can make it easier to get rid of glare on the screen or let you angle it for a better view. Some monitors have non-glare etched screens. Others have flat screens, sectioned from a cylinder instead of a sphere. Some accept stereo sound, or have an earphone jack. There are some that have connectors for composite video, digital and analog RGB, and are also TV's.

The weight and cabinet size can also be important. If you plan to buy a monitor stand, or support the monitor on top of your computer, check the maximum weight your system can support.

Once you've narrowed the field down to a few candidates, go out and look at the displays. Start by filling the screen with one character, the letter H or M. Check the corners of the screen. Are the characters as sharp as at the center? Are you seeing the entire display? Move the cursor across the screen at top speed. Does it smear or trail? Stand back and look at the display. Are the horizontal and vertical lines straight or bent? Does the image waver, bow, or flicker?

If you are looking at a color display, try changing the colors. Try using white for the characters, and check for color fringing. Put up a series of different colored bars, and look for smearing where two colors meet. Try turning the volume up and listen for hum.

After all this, consider which monitor looks the best—not just its display, but its design. After all, you will be looking at it for quite a while. Also check the warranty period and service location. Will your dealer be handling repairs, or will you be shipping it to the other coast for six weeks? Don't let price be the only consideration. A few extra dollars spent now can mean a great deal in satisfaction over the next few years.

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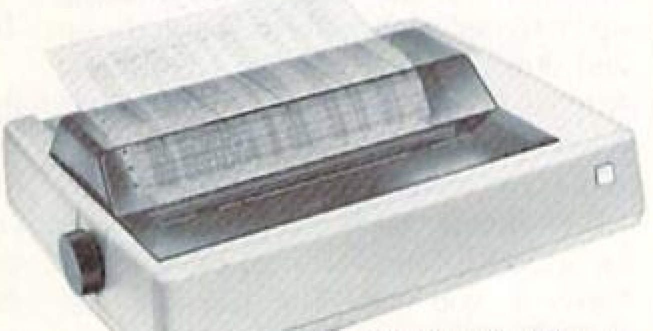

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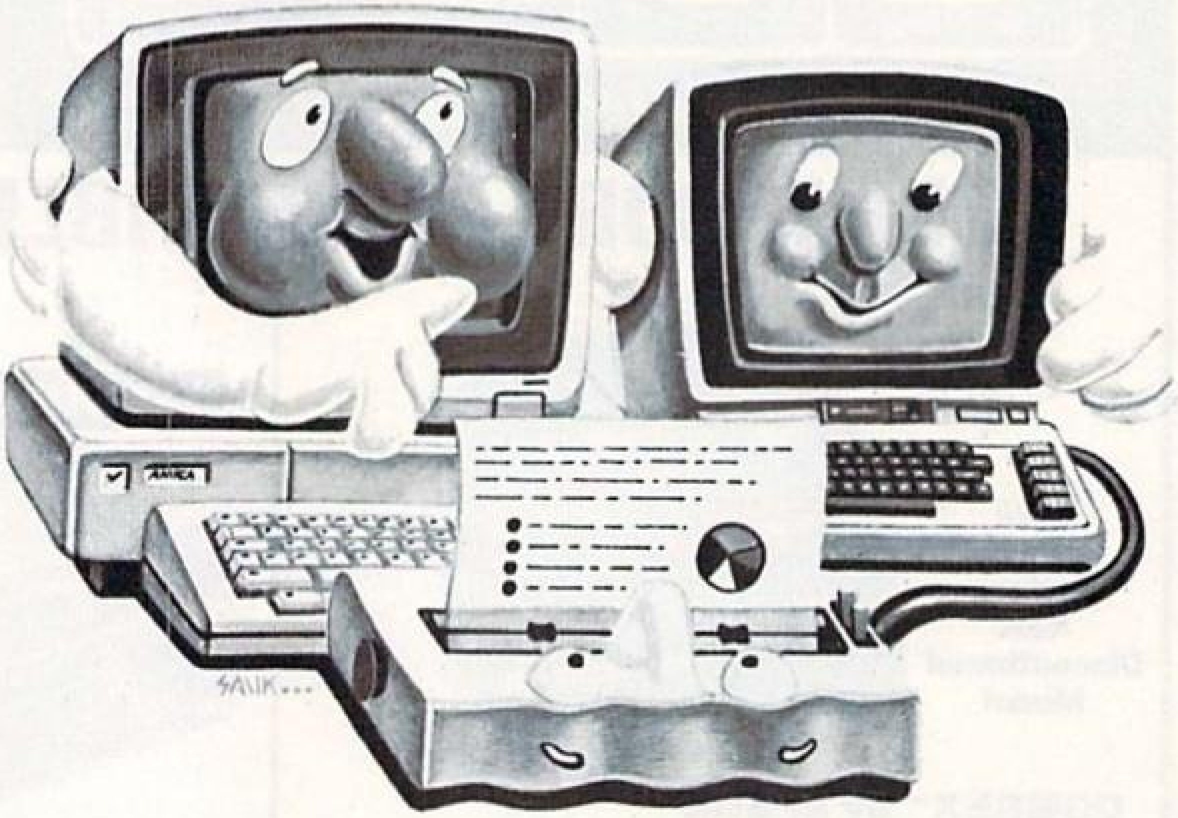
C64 Print Buffer

for the Amiga



Having upgraded to an Amiga, many new owners will be impressed with the speed and flexibility of this fantastic new tool. They will, however, have put a lot of time and money into their Commodore 64's, particularly in the form of peripherals, such as a printer. And those who purchased Commodore-compatible printers will find that they won't work with the Amiga, since the Amiga doesn't have a 64-type serial port. But never fear, because there is a way you can use your old printer! And in the process, I'll describe a new use for your 64, too.

By using the RS-232 communication capabilities of the 64, your Amiga can talk to a 64. This is possible because RS-232 is a standard that was established to allow peripherals to communicate. And by using the memory of the 64, a file that is sent over this link can be quickly read and stored in memory before sending it out to your 64 printer. Thus, your 64 can be a print buffer for an Amiga, freeing the Amiga for other tasks while allowing you to continue to use your old printer.

There are two catches, however. The program will only work with printers that connect to the serial port on the 64 (that's the round, six-pin connector that also goes to the disk drive). Those printers that connect to the user port will not work. Also, you need an RS-232 adapter for the 64. The adapter restores the 64's voltage levels to meet RS-232 standard, which the Amiga does adhere to. An adapter can generally be purchased for under $50. More on how to select and use an RS-232 interface later.

Using the Print Buffer

To use the program, first type it in to your 64 and save it. No special software is required for the Amiga. Next, with your computers off, connect the RS-232 interface. It slides into the user port on the back of the 64 and connects to the Amiga through a 25-pin connector with screws to hold it in place. (A 25-pin male DB25-type connector is required at the Amiga end of the connection. This is usually supplied with the RS-232 adapter.) When the computers and their peripherals are properly connected, turn them on. The Amiga now has to be set up for serial communication.

Set-up for the Amiga

On the Amiga, you need to select a 1200-baud serial printer as the device to be used for I/O. This is accomplished by using the Preferences utility (see your *Introduction to Amiga* guide for information on using the Preferences tool if you are not familiar with it). After calling up Preferences, click the mouse in the up and down arrows near the label "Baud Rate" to change the rate to 1200. Then select the box marked "Change Printer" and a new menu will appear. Select "Serial" in the upper left quadrant, then exit by selecting "Ok" followed by "Use" or "Save," as you wish. The Amiga is now properly set up.

Set-up for the 64

On your 64, use the following commands to load and run the print buffer.

```
LOAD "filename",8
RUN
```

A menu appears with the choices of returning to BASIC, printing a file, or changing the default settings for the program. Selecting to change the defaults lets you decide whether or not you want a header at the top of each page. The header can consist of the file name, the page number and the date. By stepping through the defaults menu, you can choose any combination of these to appear. File names can be up to 20 characters long and the date up to 11 characters long. To set the number of lines per page, use the up and down cursor keys to set the value on the screen and hit RETURN when you have the number you want. The standard defaults are set to print all three pieces of information in the header with 66 lines per page.

To Print a File

To print a file, select option two from the menu. The program will ask you for the file name and date, if those options have been selected, and then will proceed to wait for data from the Amiga. On the Amiga, you open a CLI window (see the *AmigaDOS User's Manual* for information on opening a CLI window) and simply type:

```
COPY filename TO SER:
```

From here on, the transfer proceeds automatically. The file will take a few seconds to transfer to the 64, depending on its length. Following this, the CLI prompt will return and your 64 printer will start to print. After it is done printing, the menu will return on the 64, allowing you to print another file if you wish. (Note that the date will only be asked for once,

Continued on pg. 86

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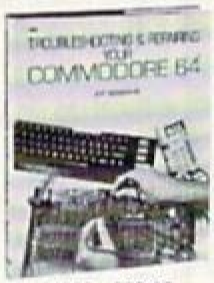
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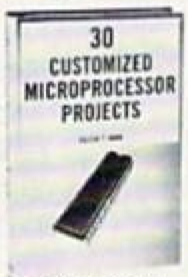
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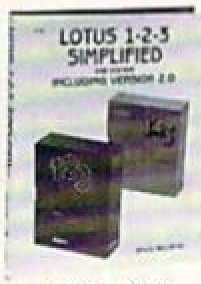
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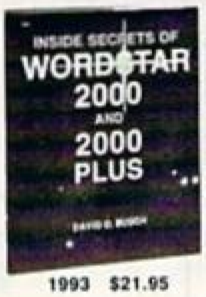
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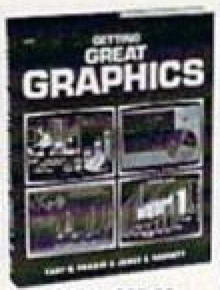
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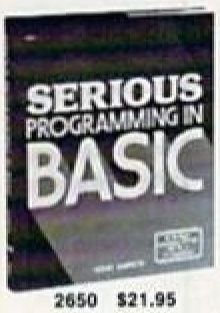
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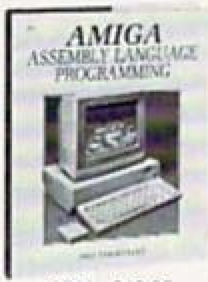
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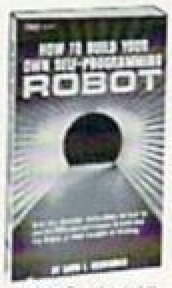
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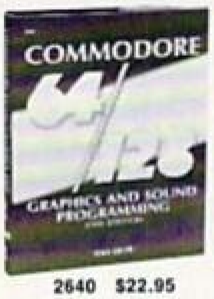
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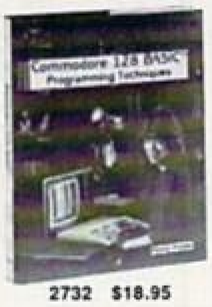
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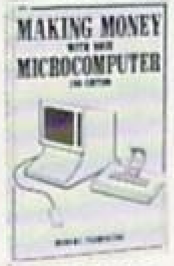
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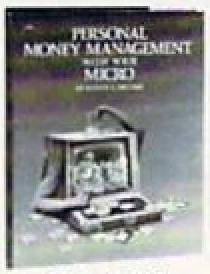
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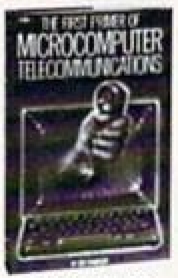
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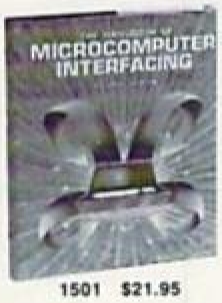
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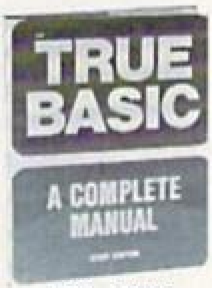
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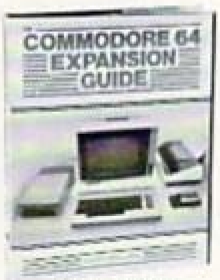
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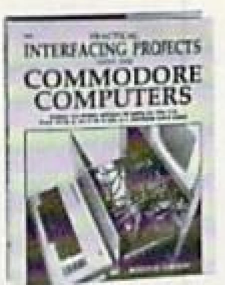
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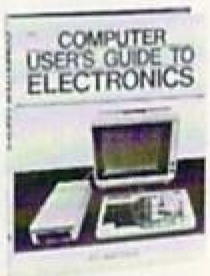
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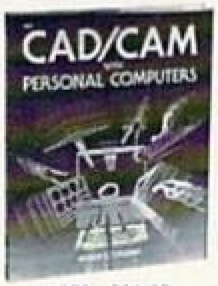
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the first time through.) The memory configuration used on the 64 allows up to 49,400 characters to be stored, which is about 11 pages of dense, single-spaced text (22 if double-spaced). If you need to print files that are larger than this, you will have to break them into smaller pieces.

The RS-232 Interface

When looking for an RS-232 adapter, you need to be sure to get one that can be set up so that the 64 acts as the slave peripheral (the one that is being talked to), rather than the master (which is sending the signals). Here's what to look for to ensure that the adapter you get (or have) will work. You don't have to understand all the terms used here, you just have to be sure your adapter matches this description.

Part of the RS-232 interface standard defines how two devices send signals to each other. Because there are only a few wires to talk through, there has to be an agreement at both ends on who talks when. The way they reach this agreement is through handshaking. Several wires are used for handshaking, and in particular, there are two used for sending Receive and Transmit handshakes, connected to pins two and three in the DB25 connector. These connections have to be made correctly in order for one computer to talk to another.

To properly communicate, the transmit line of one device should be connected to the receive line of the other, and vice versa. Because the Amiga will be sending data to the 64, the 64 has to be set up as a device which is intended to be usually listening to another (like a printer listens to a computer). The connections required to make this happen on the 64 end are specified as follows:

Connecting pins	*Mode*
2,3	DCE mode (3=Transmit, 2=Receive)
20	HSK mode (pins 20 and 5,6 reversed at 64 end)

Many RS-232 connectors have switches built in so that they can be adapted to any required task. These will come with a description of how to properly set the switches. An example is the Deluxe RS-232 Interface from Omnitronix, which is the adapter I used in developing this program. It has four switches which are set as follows.

Switch #	*Setting*
1	5,6 & 8 NORM
2	(3T,2R) DCE
3	20 HSK
4	DTR/RTS HI

These adapters connect to the user port on the 64, which is why printers which also connect to the user port cannot be used with this routine. As long as your RS-232 adapter can meet these specifications, it should work correctly. For those who are interested, the default settings for the RS-232 connection on the Amiga are a baud rate of 1200, one stop bit and seven data bits. ■

Before typing these programs, read "How to Enter Programs," and "How to Use the Magazine Entry Program." The BASIC programs in this magazine are available on disk from Loadstar, P.O. Box 30007, Shreveport, LA 71130-0007, 1-800-831-2694.

C64 Print Buffer

```
10 FOR I=20480 TO 20522'DLZB
20 READ A:POKE I,A:NEXT I'DHIB
30 FOR I=30720 TO 32446'DLFD
40 READ A:POKE I,A:NEXT I'DHID
50 SYS 20480'BFFC
20480 DATA 169,0,133,251,169,120'BVTC
20486 DATA 133,252,169,0,133,253'BVSI
20492 DATA 169,8,133,254,160,0'BTWF
20498 DATA 177,251,145,253,230,
      251'BXVL
20504 DATA 230,253,208,246,230,
      252'BXQF
20510 DATA 230,254,165,252,201,
      128'BXQC
20516 DATA 208,236,76,48,11,255'BUGC
20522 DATA 0'BBDB
25000 REM'BARW
30720 DATA 0,13,8,10,0,158'BPOF
30726 DATA 40,50,56,54,52,41'BRYF
30732 DATA 0,0,0,169,0,133'BPKC
30738 DATA 45,133,251,169,147,32'BVBJ
30744 DATA 210,255,169,9,32,210'BUTG
30750 DATA 255,169,14,32,210,255'BVWD
30756 DATA 173,51,11,240,100,173'BVGJ
30762 DATA 54,11,240,42,162,8'BSVF
30768 DATA 160,8,169,15,32,144'BTYM
30774 DATA 13,69,78,84,69,82'BREI
30780 DATA 32,70,73,76,69,78'BRXF
30786 DATA 65,77,69,58,160,0'BRSL
30792 DATA 32,207,255,153,57,11'BUUJ
30798 DATA 200,192,20,208,1,136'BUIP
30804 DATA 201,13,208,240,173,53'BVLD
30810 DATA 11,240,48,173,56,11'BTRA
30816 DATA 208,43,169,1,141,56'BTYG
30822 DATA 11,162,10,160,8,169'BTQD
30828 DATA 11,32,144,13,69,78'BSBJ
30834 DATA 84,69,82,32,68,65'BRAF
30840 DATA 84,69,58,160,0,32'BRKC
30846 DATA 207,255,153,78,11,200'BVSJ
30852 DATA 192,12,208,1,136,201'BUKG
30858 DATA 13,208,240,169,62,133'BVUM
30864 DATA 1,169,40,141,0,8'BQUI
30870 DATA 169,96,141,1,8,169'BSNG
30876 DATA 2,162,0,160,8,32'BQQL
30882 DATA 189,255,169,2,162,2'BTHJ
30888 DATA 160,255,32,186,255,32'BVAP
30894 DATA 192,255,162,2,32,198'BUEM
30900 DATA 255,169,0,133,253,169'BVFA
30906 DATA 15,133,254,32,228,255'BVWG
30912 DATA 133,61,32,183,255,41'BUTD
30918 DATA 8,208,244,165,61,201'BUVJ
30924 DATA 0,240,238,74,76,239'BTFG
30930 DATA 8,32,228,255,133,61'BTYD
30936 DATA 165,62,24,105,1,133'BTNJ
30942 DATA 62,165,63,105,0,133'BTPG
30948 DATA 63,201,112,240,33,165'BVJM
30954 DATA 61,201,0,240,228,160'BUGJ
30960 DATA 0,132,62,132,63,160'BTJG
30966 DATA 0,145,253,165,253,24'BUTM
30972 DATA 105,1,133,253,165,254'BVQJ
30978 DATA 105,0,133,254,201,208'BVGP
30984 DATA 208,201,169,2,32,195'BUWM
30990 DATA 255,169,0,133,106,169'BVCJ
30996 DATA 15,133,107,169,0,162'BURP
31002 DATA 0,160,8,32,189,255'BSBA
```

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31014 DATA 32,186,255,32,192,255'BVFD
31020 DATA 162,128,32,201,255,173'BWSA
31026 DATA 51,11,240,3,32,180'BSMF
31032 DATA 10,160,0,177,106,168'BUQD
31038 DATA 185,131,9,32,168,255'BUGD
31044 DATA 32,131,10,165,106,24'BUHA
31050 DATA 105,1,133,106,165,107'BVKD
31056 DATA 105,0,133,107,197,254'BVSD
31062 DATA 208,225,165,106,197,
      253'BXAB
31068 DATA 208,219,173,52,11,56'BUYG
31074 DATA 229,45,168,136,136,192'BWLD
31080 DATA 0,240,8,169,13,32'BRWF
31086 DATA 168,255,136,208,248,
      169'BXMH
31092 DATA 55,133,1,169,128,32'BTXD
31098 DATA 195,255,32,174,255,32'BVFJ
31104 DATA 204,255,96,0,0,0'BQSC
31110 DATA 133,0,0,0,0,8'BNMX
31116 DATA 160,13,0,13,13,0'BQEF
31122 DATA 0,136,135,0,134,0'BRKC
31128 DATA 0,0,0,0,0,0'BLBB
31134 DATA 0,0,0,0,0,160'BNEE
31140 DATA 33,34,35,36,37,38'BRJC
31146 DATA 39,40,41,42,43,44'BRAC
31152 DATA 45,46,47,48,49,50'BRSF
31158 DATA 51,52,53,54,55,56'BRJF
31164 DATA 57,58,59,60,61,62'BRSC
31170 DATA 63,64,193,194,195,196'BVVA
31176 DATA 197,198,199,200,201,
      202'BXDG
31182 DATA 203,204,205,206,207,
      208'BXKD
31188 DATA 209,210,211,212,213,
      214'BXBJ
31194 DATA 215,216,217,218,91,191'BWBG
31200 DATA 93,94,175,39,65,66'BSYA
31206 DATA 67,68,69,70,71,72'BRYF
31212 DATA 73,74,75,76,77,78'BRIC
31218 DATA 79,80,81,82,83,84'BRYC
31224 DATA 85,86,87,88,89,90'BRRF
31230 DATA 179,221,171,186,8,0'BTCD
31236 DATA 0,0,0,0,0,0'BLBB
31242 DATA 0,0,0,0,0,0'BLBE
31248 DATA 0,0,0,0,0,0'BLBE
31254 DATA 0,0,0,0,0,0'BLBB
31260 DATA 0,0,0,0,0,0'BLBE
31266 DATA 0,0,0,0,0,0'BLBE
31272 DATA 0,0,0,0,0,0'BLBB
31278 DATA 0,0,0,0,0,0'BLBH
31284 DATA 0,0,0,0,0,0'BLBE
31290 DATA 0,0,0,0,0,0'BLBB
31296 DATA 0,0,0,0,0,0'BLBH
31302 DATA 0,0,0,0,0,0'BLBB
31308 DATA 0,0,0,0,0,0'BLBB
31314 DATA 0,0,0,0,0,0'BLBE
31320 DATA 0,0,0,0,0,0'BLBB
31326 DATA 0,0,0,0,0,0'BLBB
31332 DATA 0,0,0,0,0,0'BLBE
31338 DATA 0,0,0,0,0,0'BLBE
31344 DATA 0,0,0,0,0,0'BLBB
31350 DATA 0,0,0,0,0,0'BLBE
31356 DATA 0,0,0,0,0,0'BLBE
31362 DATA 0,173,51,11,201,0'BRFC
31368 DATA 208,1,96,185,131,9'BSFJ
31374 DATA 201,13,240,1,96,230'BTHG
31380 DATA 45,173,52,11,56,233'BTVD
31386 DATA 6,197,45,240,1,96'BRMI
31392 DATA 169,13,32,168,255,169'BVMG
31398 DATA 13,32,168,255,169,13'BUCM
31404 DATA 32,168,255,169,13,32'BUDA
31410 DATA 168,255,169,0,133,45'BUFD
31416 DATA 230,251,173,54,11,240'BVKD
31422 DATA 17,160,0,185,57,11'BSYF
31428 DATA 201,13,240,8,32,168'BTOG
31434 DATA 255,200,192,20,208,241'BWMD
31440 DATA 173,55,11,240,45,169'BUAA
31446 DATA 46,32,168,255,169,46'BUOG
31452 DATA 32,168,255,169,46,32'BUJD
31458 DATA 168,255,169,208,32,168'BWPJ
31464 DATA 255,169,193,32,168,255'BWPG
31470 DATA 169,199,32,168,255,169'BWAD
31476 DATA 197,32,168,255,169,160'BWOJ
31482 DATA 32,168,255,165,251,32'BVBG
31488 DATA 80,14,173,53,11,240'BTNM
31494 DATA 27,160,35,169,160,32'BUXJ
31500 DATA 168,255,136,208,248,
      160'BXDE
31506 DATA 0,185,78,11,201,13'BSTC
31512 DATA 240,8,32,168,255,200'BUTA
31518 DATA 192,11,208,241,169,13'BVUG
31524 DATA 32,168,255,169,13,32'BUDD
31530 DATA 168,255,96,0,255,255'BUMA
31536 DATA 76,90,11,1,66,1'BPAF
31542 DATA 1,1,0,0,0,0'BLDB
31548 DATA 0,0,0,0,0,0'BLBH
31554 DATA 0,0,0,0,0,0'BLBE
31560 DATA 0,0,0,0,0,0'BLBB
31566 DATA 0,0,0,0,0,0'BLBH
31572 DATA 0,0,0,0,0,0'BLBE
31578 DATA 169,1,141,32,208,141'BUPM
31584 DATA 33,208,169,0,141,134'BURJ
31590 DATA 2,169,0,133,180,169'BTXG
31596 DATA 216,133,181,169,0,160'BVSM
31602 DATA 255,162,4,145,180,136'BVXA
31608 DATA 16,251,230,181,202,208'BWLG
31614 DATA 246,169,0,133,180,169'BVED
31620 DATA 4,133,181,169,32,160'BUUA
31626 DATA 255,162,4,145,180,136'BVXG
31632 DATA 16,251,230,181,202,208'BWLD
31638 DATA 246,169,147,32,210,255'BWCJ
31644 DATA 162,3,160,8,169,21'BSCF
31650 DATA 32,144,13,72,73,84'BSAD
31656 DATA 32,78,85,77,66,69'BRHI
31662 DATA 82,32,79,70,32,68'BRPF
31668 DATA 69,83,73,82,69,68'BRIL
31674 DATA 162,4,160,8,169,8'BRKI
31680 DATA 32,144,13,70,85,78'BSEG
31686 DATA 67,84,73,79,78,162'BSAM
31692 DATA 9,160,16,169,19,32'BSFJ
31698 DATA 144,13,49,32,45,32'BSBO
31704 DATA 67,72,65,78,71,69'BREC
```

Continued on pg. 90

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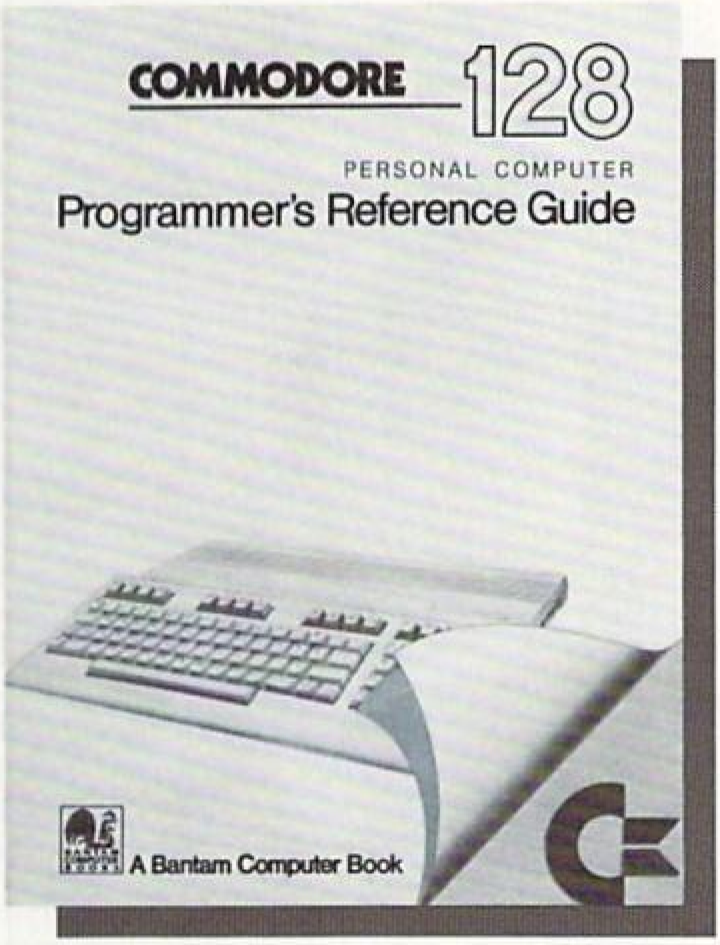

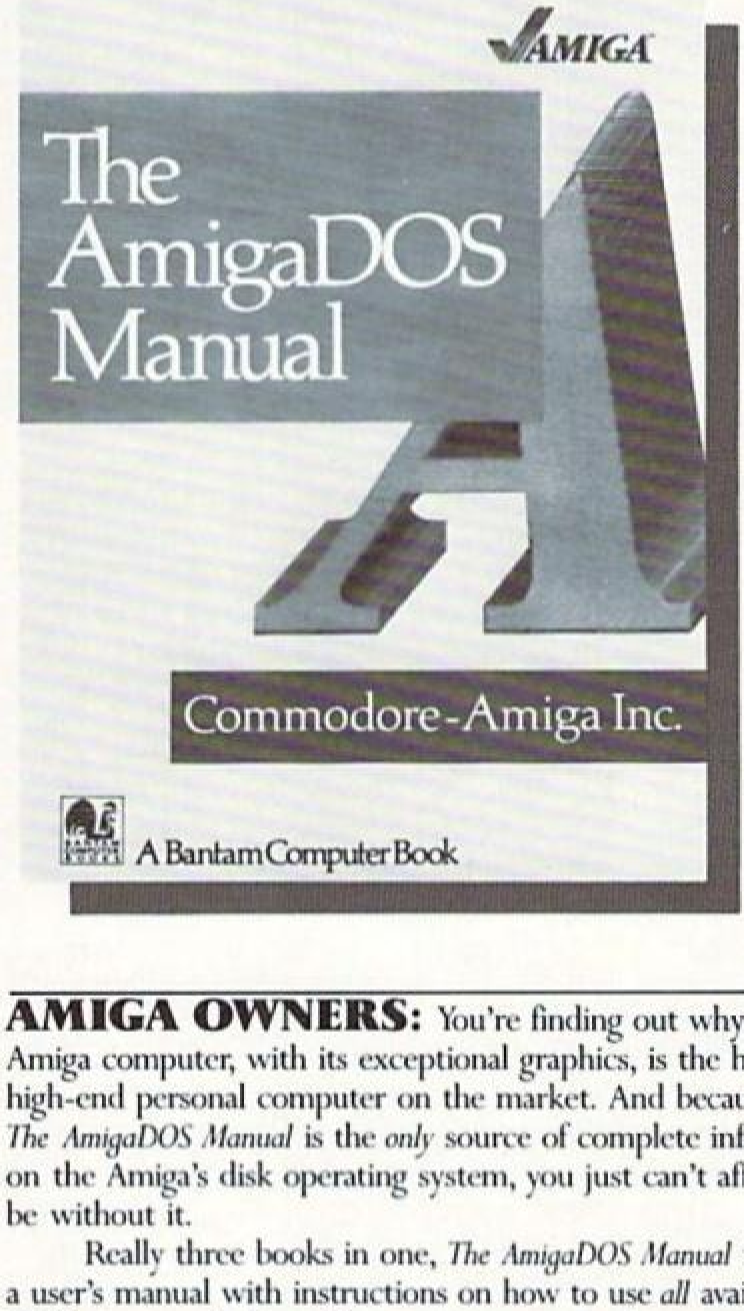

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Continued from pg. 88

```
31710 DATA 32,68,69,70,65,85'BRXF
31716 DATA 76,84,83,162,11,160'BTCG
31722 DATA 16,169,9,32,144,13'BSBD
31728 DATA 50,32,45,32,80,82'BRAI
31734 DATA 73,78,84,162,13,160'BTFG
31740 DATA 16,169,8,32,144,13'BSAD
31746 DATA 51,32,45,32,81,85'BRFI
31752 DATA 73,84,32,228,255,201'BUAG
31758 DATA 0,240,249,201,49,240'BUOM
31764 DATA 19,201,50,240,6,201'BTGJ
31770 DATA 51,240,8,208,235,32'BTSG
31776 DATA 15,8,76,48,11,108'BRIL
31782 DATA 0,160,169,147,32,210'BUOJ
31788 DATA 255,162,3,160,8,169'BTDP
31794 DATA 18,32,144,13,80,65'BSCL
31800 DATA 71,69,32,72,69,65'BRVF
31806 DATA 68,69,82,83,32,40'BRRF
31812 DATA 89,47,78,41,32,228'BSQD
31818 DATA 255,201,0,240,249,201'BVIJ
31824 DATA 89,240,14,201,78,240'BUXG
31830 DATA 2,208,239,169,0,141'BTVD
31836 DATA 51,11,76,48,11,32'BRXI
31842 DATA 210,255,169,1,141,51'BUPG
31848 DATA 11,162,4,160,9,169'BSDL
31854 DATA 24,32,144,13,80,65'BSYI
31860 DATA 71,69,32,78,85,77'BRDF
31866 DATA 66,69,82,32,72,69'BRYL
31872 DATA 65,68,69,82,32,40'BRRI
31878 DATA 89,47,78,41,32,228'BSQP
31884 DATA 255,201,89,240,15,201'BVQM
31890 DATA 78,208,245,32,210,255'BVAJ
31896 DATA 169,0,141,55,11,76'BSDO
31902 DATA 168,12,32,210,255,169'BVXD
31908 DATA 1,141,55,11,162,5'BRQI
31914 DATA 160,9,169,17,32,144'BTCG
31920 DATA 13,68,65,84,69,32'BRTC
31926 DATA 72,69,65,68,69,82'BRHI
31932 DATA 32,40,89,47,78,41'BRPF
31938 DATA 32,228,255,201,89,240'BVYM
31944 DATA 15,201,78,208,245,32'BUVJ
31950 DATA 210,255,169,0,141,53'BUQG
31956 DATA 11,76,224,12,32,210'BTHM
31962 DATA 255,169,1,141,53,11'BTSJ
31968 DATA 162,6,160,9,169,21'BSBP
31974 DATA 32,144,13,70,73,76'BSEL
31980 DATA 69,78,65,77,69,32'BRII
31986 DATA 72,69,65,68,69,82'BRHO
31992 DATA 32,40,89,47,78,41'BRPL
31998 DATA 32,228,255,201,89,240'BVYS
32004 DATA 15,201,78,208,245,32'BUVD
32010 DATA 210,255,169,0,141,54'BURA
32016 DATA 11,76,28,13,32,210'BSSF
32022 DATA 255,169,1,141,54,11'BTTD
32028 DATA 162,7,160,9,169,22'BSDD
32034 DATA 32,144,13,85,83,69'BSIA
32040 DATA 32,67,85,82,83,79'BRBC
32046 DATA 82,32,75,69,89,83'BRDC
32052 DATA 32,84,79,32,83,69'BRWF
32058 DATA 84,162,8,160,9,169'BSMG
32064 DATA 11,32,144,13,76,73'BSYC
32070 DATA 78,69,83,47,80,65'BREF
32076 DATA 71,69,58,169,66,141'BTSG
```

```
32082 DATA 52,11,162,9,160,20'BSRC
32088 DATA 32,208,13,32,228,255'BUTJ
32094 DATA 201,145,240,11,201,17'BVBG
32100 DATA 240,16,201,13,208,241'BVGA
32106 DATA 76,48,11,238,52,11'BSAA
32112 DATA 173,52,11,76,81,13'BSCC
32118 DATA 206,52,11,173,52,11'BTKD
32124 DATA 76,81,13,255,0,130'BSXF
32130 DATA 255,255,0,0,255,255'BTVD
32136 DATA 0,0,255,255,0,0'BPLC
32142 DATA 255,255,133,14,104,133'BWPA
32148 DATA 12,104,133,13,24,165'BUIG
32154 DATA 12,101,14,133,15,165'BUGD
32160 DATA 13,105,0,72,165,15'BSSF
32166 DATA 72,24,32,240,255,166'BUWG
32172 DATA 14,232,134,14,160,1'BTGD
32178 DATA 177,12,32,210,255,200'BVJJ
32184 DATA 196,14,208,246,96,0'BTGG
32190 DATA 255,255,0,0,255,255'BTVD
32196 DATA 0,0,255,255,0,0'BPLI
32202 DATA 255,255,9,0,255,255'BTFD
32208 DATA 133,252,24,32,240,255'BVOD
32214 DATA 166,252,208,16,169,32'BVEA
32220 DATA 32,210,255,169,32,32'BURD
32226 DATA 210,255,169,48,32,210'BVUD
32232 DATA 255,96,248,169,0,133'BUKA
32238 DATA 97,133,98,24,169,1'BSOG
32244 DATA 101,97,133,97,144,2'BTAD
32250 DATA 230,98,202,208,242,216'BWUA
32256 DATA 165,98,240,9,24,105'BTEG
32262 DATA 48,32,210,255,56,176'BUDD
32268 DATA 5,169,32,32,210,255'BTTJ
32274 DATA 165,97,41,240,74,74'BTJG
32280 DATA 74,74,240,9,24,105'BSAD
32286 DATA 48,32,210,255,56,176'BUDJ
32292 DATA 17,165,98,240,8,169'BTPG
32298 DATA 48,32,210,255,56,176'BUDM
32304 DATA 5,169,32,32,210,255'BTTA
32310 DATA 165,97,41,15,24,105'BTYD
32316 DATA 48,32,210,255,96,255'BUFD
32322 DATA 0,0,255,255,0,0'BPLF
32328 DATA 255,255,0,0,242,255'BTRG
32334 DATA 0,0,133,252,166,252'BTLD
32340 DATA 208,16,169,32,32,168'BUEA
32346 DATA 255,169,32,32,168,255'BVJG
32352 DATA 169,48,32,168,255,96'BUVD
32358 DATA 248,169,0,133,97,133'BUGJ
32364 DATA 98,24,169,1,101,97'BSJG
32370 DATA 133,97,144,2,230,98'BTED
32376 DATA 202,208,242,216,165,98'BWCJ
32382 DATA 240,9,24,105,48,32'BSAF
32388 DATA 168,255,56,176,5,169'BUTM
32394 DATA 32,32,168,255,165,97'BULJ
32400 DATA 41,240,74,74,74,74'BSGD
32406 DATA 240,9,24,105,48,32'BSAC
32412 DATA 168,255,56,176,17,165'BVQA
32418 DATA 98,240,8,169,48,32'BSPG
32424 DATA 168,255,56,176,5,169'BUTD
32430 DATA 32,32,168,255,165,97'BULA
32436 DATA 41,15,24,105,48,32'BSVF
32442 DATA 168,255,96,255,0,0'BSFD
```

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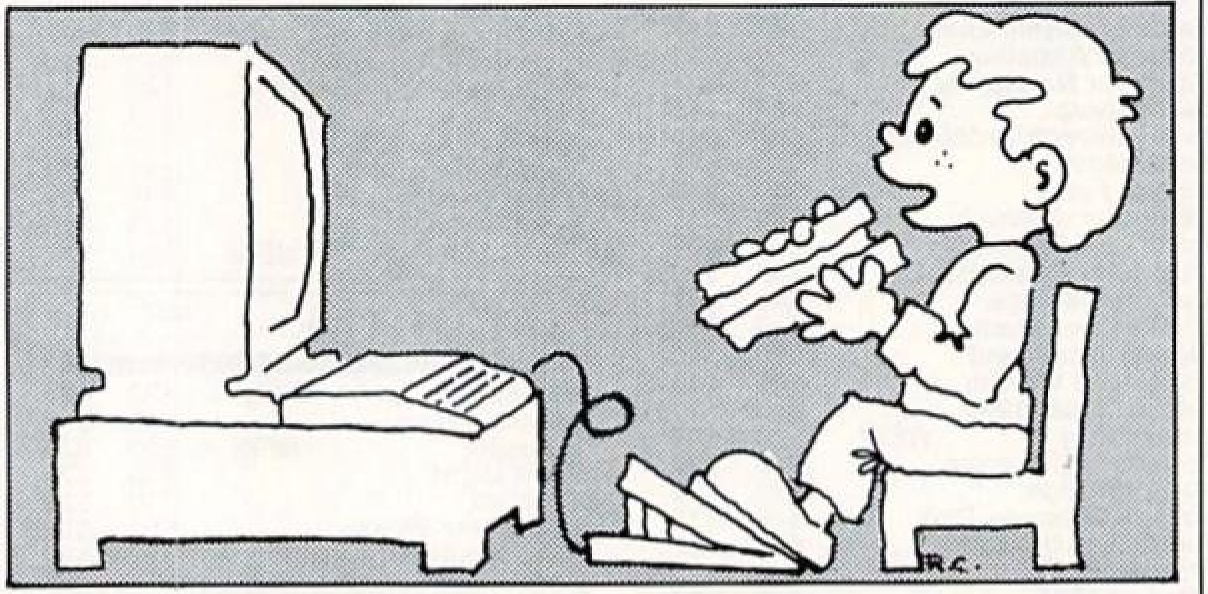
BY RICHARD F. DALEY and SALLY J. DALEY

How to Make a Foot-Controlled Joystick

Game Port Tutorial, Part 2



This is the second in a series of articles to help you understand the game ports on your Commodore 64. You will learn to access the game ports using programs and peripherals.

We can hear you now: I knew you guys wouldn't get far into this "beyond the joystick" game port tutorial series without including an article about the joystick.

You are right. However, we have a question for you. How well do you understand the techniques required to program the game ports to respond to a joystick and what do you think of a foot-controlled joystick?

The type of joysticks used on Commodore 64 computers are digital joysticks. This means that each joystick has five separate switches. Four of these switches are used for direction and the fifth is the fire button. These switches (numbered 0 to 4) are arranged as follows:

```
FIRE (4)
              UP (0)
                 !
                 !
LEFT (2) —+—RIGHT (3)
                 !
                 !
            DOWN (1)
```

If you have a joystick handy, pick it up and hold it normally. Press the handle toward the top; this closes switch 0. Press the fire button; this closes switch 4, and so it goes.

Mouse-Trak converts your joystick (or trackball) to a mouse, and is ideal for use with the joystick that you will be building!

The five joystick switches are attached to the lower five bits of memory locations 56320 or 56321 (hex $DC00 or $DC01). When accessing a joystick from BASIC, these five bits are normally set to one. A one indicates an open switch. After a switch is closed, the corresponding bit is then set to zero. To help you understand how to program this, look at Listing 1. This program will read the position of a joystick in game port 2 and will then tell you the position of the handle of the joystick.

This program works as follows:

100: Sets up an array for the direction names.
110: Reads the array from the DATA statements into memory.
120: Clears the screen.
130: Reads the data from game port 2. To change the program to read game port 1, enter PEEK(56321).
140: Extracts the fire button status from the port.
150: Extracts the lower four bits from the data and complements it.
160: Eliminates repeating the same variable. Delete this line and you'll see the direction strings repeat themselves on the screen.
170: Checks to see if a valid direction string can be printed.
180: Prints a direction string.
190: Checks to see if the fire button is pressed. If not, the value of FB will be 16. If it is pressed, FB will be zero.
200: Eliminates repeating the word FIRE on the screen. Without this line, you'll see it printed repeatedly on the screen as long as the fire button is pressed.
210: Prints the word FIRE.
220: Goes back for another look at the fire button.
230-240: DATA statements with the direction strings.

Because a machine-language routine usually works faster and more reliably than its BASIC equivalent, Listing 2 is a BASIC listing that incorporates a machine-language routine.

This program works as follows:

100: Sets up an array for the direction names.
110: Reads the array from the DATA statements into memory.
120-130: Transfers the machine language program from the DATA statements and

stores it in memory.
140: Clears the screen.
150: Calls the machine language subroutine, then reads the fire button and joystick direction data.
160-240: Same as 160 to 240 in Listing 1.
250-260: DATA statements with the machine-language program in them.

Mouse-Trak

Now that you understand the program in Listing 1, you are ready to use Mouse-Trak. Mouse-Trak converts your joystick (or trackball) to a mouse, and is also ideal for use with the joystick that you will build later.

Type in Mouse-Trak. It is a BASIC loader for the Mouse-Trak program. Save the program and run it. The BASIC program will then move Mouse-Trak to its memory location and install it. When this is finished, the BASIC program will erase itself from memory.

Mouse-Trak performs a number of different functions in response to joystick movements. To explore these functions, connect a joystick or a trackball to game port 2. Now move the handle of the joystick. Pull it toward you and the cursor will move towards the bottom of the screen. Move it up and the cursor will move up. Similarly, the cursor will move right or left by moving the handle of the joystick in those directions.

But wait, there is more to Mouse-Trak than just moving the cursor around. Press the fire button and release it. Now move the handle up. The screen will clear. Move the handle down. This is equivalent to pressing the RETURN key. Move the handle left to delete characters. Move the handle right to insert spaces. Press the fire button again, and you return to the cursor movement keys.

Mouse-Trak can be used not only while editing a program that you are writing, but from within many other BASIC programs. While we have not tested it on any commercial programs, it should work with at least some of them. We have written a freeware word processor, similar to *EasyScript* or *Paperclip,* which uses this type of editing. We are hooked!

There is a problem, however, with using a joystick to edit a BASIC program or to edit a document using a word processor. To use the joystick as an editing tool, you must lift your hands from the keyboard and pick up the joystick before using it. This takes time, more time than using the equivalent cursor keys on the keyboard.

A foot joystick lets you edit without lifting your hands from the keyboard.

Constructing the Foot Joystick

The rest of this article will show you how to construct a joystick that you can use with your feet. This means that you can have all the advantages of editing with the joystick while avoiding the problem of moving your hands from the keyboard.

First, obtain the materials listed in Table 1. The springs should be firm enough so that they are difficult to compress between your fingers. Don't underestimate the compression strength of the springs—remember, you will be using the joystick with your feet.

Cut the six pieces of plywood following the diagram in Figure 1. Draw a diagonal line on part D connecting points 1/2 inch from the opposite corners and cut this part into two pieces.

Next, drill the holes for attaching the joystick platform and the firebutton peddle onto the base. Position part C, the joystick platform, onto part A, the top of the base, so that part C is 1/8 inch from the top, bottom, and one end of part A. We put the platform on the right of our joystick, but after using it for awhile, felt it would have been better on the left.

Hold the pieces together with a couple of six-penny finishing nails. Do not drive the nails completely into the wood. They should go only about 1/4 inch into part A. On part C make a pencil mark in the center of each side, 2 inches in from the edge and drill four 3/16 inch holes at these marks through both parts.

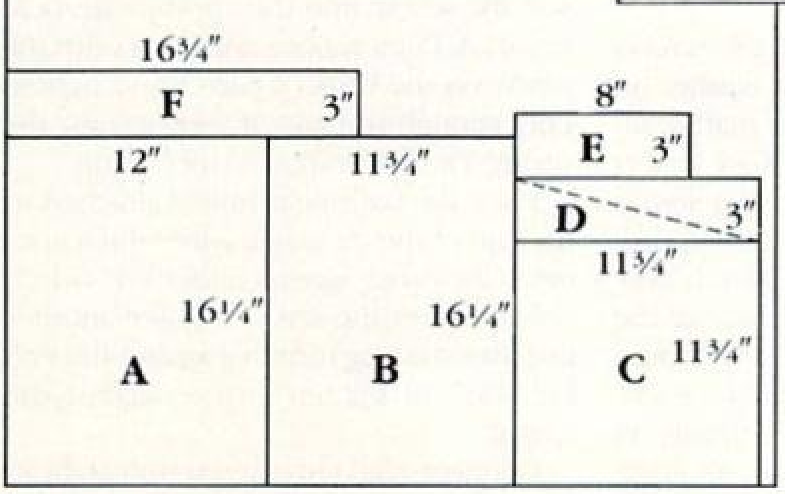
Center part E, the firebutton peddle, between the top and bottom of the remaining portion of part A 1/4 inch from the edge. Nail it in place. Drill a 3/16 inch hole through both boards centered on part E 1½ inches from the top edge. Then drill two more 3/16 inch holes through both parts 1/2 inch from the bottom corners of part E.

Separate the three parts by removing the nails—be careful not to damage the wood while doing so. Enlarge the holes in part A to 1/4 inch. Drill two additional 3/16 holes in part A 3/4 inch on either side of the four holes that match part C and the one hole at the top of part E to attach the metal switch contacts.

Now find the exact center of part C and using a 1/2 inch drill bit make a dimple in the wood for the marble to rest in. Drill only deep enough for the drill bit to barely make a 1/2 inch circle in the wood. Find the corresponding spot on part A and make another 1/2 inch dimple in the wood.

Cut five strips of metal 1/2 inch wide by 3 inches long to make the switch contacts. Ours was cut from a heavy food storage can. Bend them as shown in Figure 2. Next drill a 3/16 inch hole 1/4 inch from each end of the metal strips. Be careful while drilling these holes. The metal has sharp edges and if it gets

Figure 1 Plywood Diagram



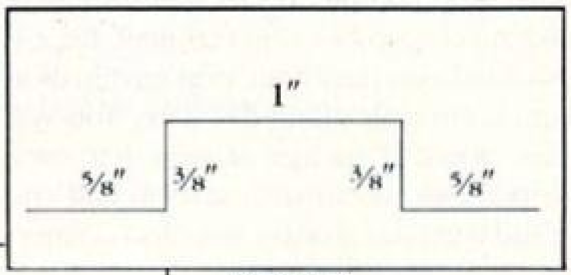


Figure 2
Switch Contact Diagram

Don't underestimate the compression strength of the springs—remember, you will be using the joystick with your feet.

caught on the drill bit, it can cut your hand very easily.

The final hole to be drilled is a 1/4-inch hole in the exact center of part F, the back of the base, for the connector cable. Now, using a countersink bit or a standard 3/8 inch bit, countersink all the holes drilled in both parts C and E. This is to make sure that the screw heads do not protrude above the surface of these pieces. Paint or finish one side of part A and the underside of parts C and E at this time.

Using two round head screws, a washer and a nut, attach the metal switch connectors to the unfinished side of part A so that the piece of metal will straddle the 1/4 inch holes. Then insert a 2½ inch long flat head screw into each of the four holes in part C. Place a washer onto the screws and tighten a nut over it. Do the same for the top hole in part E.

Strip 1/2 inch of insulation from one end of the 26-inch length of 22-gauge wire. Attach a ring terminal. Measure 6 inches from the ring terminal and at that point strip another 1/2 inch of insulation and attach another ring terminal. Repeat this until you have four ring terminals at 6-inch intervals along the wire. You will have about 2 inches of wire left over. Strip 1/2 inch of insulation from that end of the wire and attach a butt end connector.

Place a spring on each of the screws attached to part C and put a washer on the end of the spring. Put the marble on the dimple in the wood. Now insert these screws into the matching holes on part A. The ends of the screws will protrude underneath the metal switch contacts. Put a washer over the ends of the screws and loosely tighten a nut onto each screw. Tighten enough to make sure that the marble is held firmly in place, but not so much that you compress the spring. If you must compress the spring, then you have springs that are too long. Obtain shorter ones or trim these with a hacksaw.

Beginning with the ring terminal nearest the butt end connector, wire together all four screws that are under the switch terminals. Start wiring with the screw at the top of part A and go counter-clockwise around the four screws. There will be a ring terminal left over which you will later attach to the fire button.

Place a nut over these ring terminals and tighten. The best way to tighten these nuts is with an open end wrench and pliers. Do not compress the springs, but tighten the second nut onto the first one. At this point, press down on part C in any direction and look at the contact between the screw and the metal strips bridging the screws. There should be firm contact near the end of travel of the screw.

Strip about 10 inches of casing from one end of the 6-conductor cable. Then strip 1/2 inch of insulation from each of the wires inside the cable. Attach a ring terminal to the ends of five of these wires. If your cable has six different colors, you are in luck. If not, then you will need to have access to a conductivity tester to match ends of the wire when you connect the D connector.

Remove the nut from one of the screws holding the metal strips in place. Slip a ring terminal over the screw and tighten the nut over it. Repeat for the other three brackets. Connect the wire without a ring terminal to the other end of the butt connector.

Installing the Fire Button

To install the fire button, insert a 2½ inch long screw through the hole near the top center of part E. Place a washer on the screw and tighten a nut over the washer. Put the last spring followed by another washer onto the screw and insert the screw into the appropriate hole in part A. Put a washer and a nut onto the screw on the back of part A and tighten only enough to make it snug against the spring. Do not compress the spring.

Place the last ring terminal attached to the end of the 22-gauge wire which connects the other screws under the switch contacts over the screw. Tighten another nut over the ring terminal against the first nut. Do not tighten further against the spring.

Connect the last ring terminal from the 6-wire cable to one of the screws holding the metal switch connector in place. Now insert the two 2-inch long screws through the two holes in the bottom of the fire button. Use a washer and two nuts on each screw to hold this end in place.

Attach the two wedges of wood cut from part D to the ends of part A and part F along the top end of part A. We used glue and finish nails to hold them in place. When dry, tie a knot in the cable near the joystick and run the other end through the hole in the center of part F. See Figure 3 for a photograph of the un-

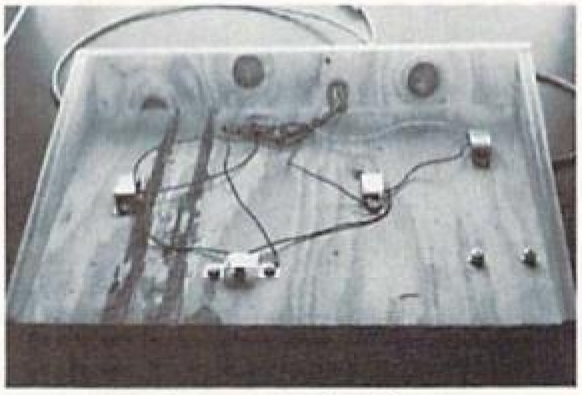


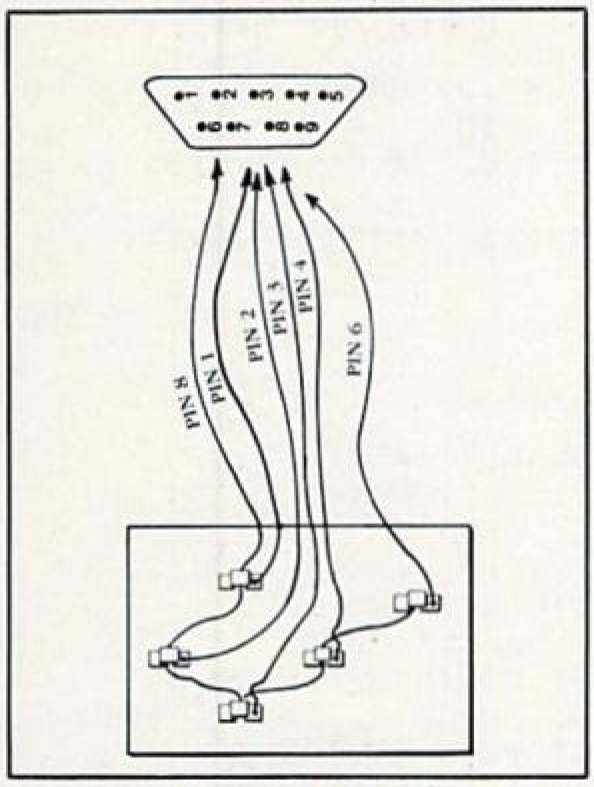
Figure 3 Underside

Table 1

Materials List for the Foot Joystick

Quan.	Description
1	3/4" plywood 2' by 3'
5	2½" long 8-32 flat head screws
2	2" long 8-32 flat head screws
10	1" long 8-32 round head screws
39	8-32 size nuts
24	1/2" washers to fit 8-32 screws
5	3/4" compression springs (see text)
1	3/4" diameter marble
1	26" length of 22-gauge stranded wire
1	6' length 6-conductor cable
10	#8 ring terminals
1	Butt end connector
1	9-pin D connector
1	hood for connector

Figure 4 Wiring Diagram



derside of the finished joystick.

Remove about 1½ inches of outer covering from the other end of the cable, and strip about 1/4 inch of insulation from the ends of the wires in the cable. Solder these wires to the 9-pin D connector as shown in Figure 4. Make sure (using a conductivity tester if necessary) that you are making the correct connections.

Once the soldering is complete, make sure that there is no excess solder making contact between adjacent pins on the 9-pin D connector. Then attach the hood to the connector.

Testing the Foot Joystick

Your joystick is now ready to test. Load and run the program in either Listing 1 or Listing 2. Connect the 9-pin D connector to game port 2, put your joystick on the floor, your feet on the platform, and use it. See Figure 5 for a look at the joystick in action. If the messages on the screen are not the same as the direction you are moving the platform of the joystick, check your wiring.

Once you are satisfied that your joystick works as it should, attach part B to the bottom of the joystick. Paint or finish the rest of your joystick.

Now for the real test. Load the Mouse-Trak program and run it. Try moving the cursor with your foot joystick. It may seem clumsy at first, but it won't take long for you to get used to it. Then load a favorite game that requires a joystick and play it using your foot joystick. You may never go back to the old style of editing or playing again!

The possibilities of using the foot joystick are endless. How about designing a game that would use the foot joystick for action? Or how about using both the foot joystick and hand joystick or the keyboard? Get those creative juices flowing. We'll bet the editor of this magazine would love to see some neat ideas. C

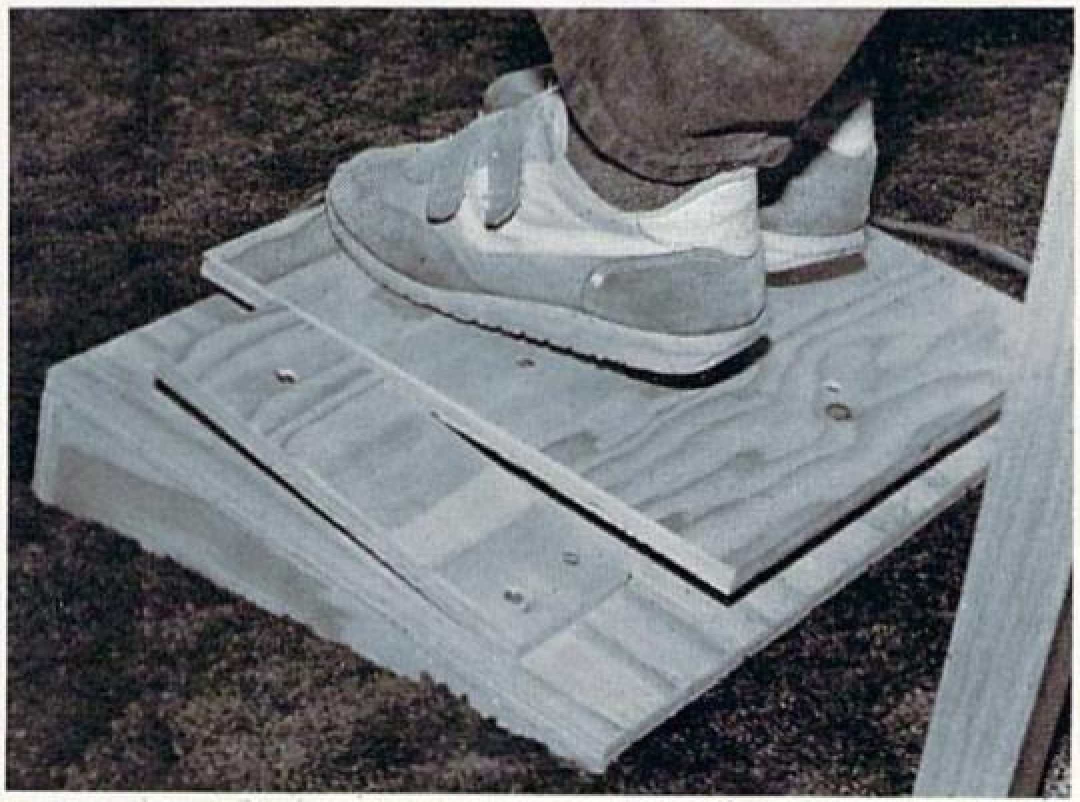


Figure 5 Foot joystick in action

Before typing this program, read "How to Enter Programs" and "How to Use the Magazine Entry Program." The BASIC programs in this magazine are available on disk from Loadstar, P.O. Box 30007, Shreveport, LA 71130-0007, 1-800-831-2694.

Listing 1

```
100 DIM DM$(10)'BHLV
110 FOR I=0 TO 10: READ DM$(I)
    : NEXT I'FNWB
120 PRINT CHR$(147)'CFBY
130 JD=PEEK(56320)'CJHB
140 FB=JD AND 16'CGVB
150 JD=15-(JD AND 15)'DKSE
160 IF JD=JT THEN 190'DHTE
170 IF DM$(JD)="" THEN JT=0
    : GOTO 190'FOJI
180 PRINT DM$(JD): JT=JD'CMSH
190 IF FB=16 THEN FT=0: GOTO 130'FLPJ
200 IF FT=-1 THEN 130'EGMY
210 PRINT" **FIRE**": FT=-1'DEPB
220 GOTO 130'BDDY
230 DATA "",UP,DOWN,"",LEFT,UP-LEFT,
    DOWN-LEFT'BHGI
240 DATA "",RIGHT,UP-RIGHT,
    DOWN-RIGHT'BBIH
```

END

Listing 2

```
100 DIM DM$(10)'BHLV
110 FOR I=0 TO 10: READ DM$(I)
    : NEXT I'FNWB
120 FOR I=49152 TO 49167: READ A'ENYC
130 POKE I,A: NEXT I'CFGA
140 PRINT CHR$(147)'CFBB
150 SYS 49152: FB=PEEK(253)
    : JD=PEEK(254)'FVKH
160 IF JD=JT THEN 190'DHTE
170 IF DM$(JD)="" THEN JT=0
    : GOTO 190'FOJI
180 PRINT DM$(JD): JT=JD'CMSH
190 IF FB=16 THEN FT=0: GOTO 150'FLRJ
200 IF FT=-1 THEN 150'EGOY
210 PRINT" **FIRE**": FT=-1'DEPB
220 GOTO 150'BDFY
```

Continued on pg. 96

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JOYSTICK

Continued from pg. 95

```
230 DATA "",UP,DOWN,"",LEFT,UP-LEFT,
    DOWN-LEFT'BHGI
240 DATA "",RIGHT,UP-RIGHT,
    DOWN-RIGHT'BBIH
250 DATA 173,0,220,170,41,16,133,
    253'BCUG
260 DATA 138,73,255,41,15,133,254,
    96'BCVH
```

END

Mouse-Trak

```
100 PRINT "[CLEAR]"'BATV
110 PRINT TAB(15);"[DOWN2]
    MOUSE-TRAK"'CEAB
120 PRINT TAB(19);"[DOWN]BY"'CEIY
130 PRINT TAB(12);"[DOWN]
    RICHARD F. DALEY"'CEPE
140 FOR I=49152 TO 49266: READ A
    : POKE I,A: CK=CK+A: NEXT I'IABJ
150 IF CK=11090 THEN 170'DKFE
160 CS%=(CS^2)/2+1: POKE 49189,CS'FTSI
170 PRINT "[DOWN]THE CURSOR SPEED
    DETERMINES HOW OFTEN"'BASM
180 PRINT "THE JOYSTICK IS READ. A
    CURSOR SPEED OF"'BATN
190 PRINT "1 READS THE JOYSTICK 30
    TIMES PER"'BAXN
200 PRINT "SECOND. WHILE A CURSOR
    SPEED OF 9 READS"'BAAG
210 PRINT "THE JOSTICK ABOUT EVERY
    3/4 SECOND."'BAMG
220 PRINT "A GOOD SPEED IS 4.
    EXPERIMENT!"'BAAG
230 INPUT "[DOWN2]WHAT CURSOR SPEED
    (1-9)";CS'BDLG
240 IF CS<1 OR CS>9 THEN PRINT "OUT
    OF RANGE": GOTO 230'HKRK
250 CS%=(CS^2)/2+1: POKE 49189,CS'FTSI
260 SYS 49152'BFMD
270 PRINT "[DOWN2]MOUSE-TRAK
    INSTALLED!": NEW'CBOK
1000 DATA 120, 173, 20, 3, 141, 46, 3,
      173, 21, 3, 141, 47'BMRA
1010 DATA 3, 169, 32, 141, 20, 3, 169,
      192, 141, 21, 3, 169'BNJB
1020 DATA 0, 133, 2, 141, 128, 1, 88,
      96, 230, 2, 165, 2'BKDC
1030 DATA 201, 8, 208, 60, 169, 0,
      133, 2, 173, 0, 220, 73'BMWD
1040 DATA 255, 168, 41, 16, 240, 8,
      169, 1, 77, 128, 1, 141'BNUE
1050 DATA 128, 1, 162, 0, 152, 61,
      103, 192, 208, 8, 232, 224'BPSG
1060 DATA 4, 144, 245, 76, 100, 192,
      173, 128, 1, 240, 5, 138'BPEH
1070 DATA 24, 105, 4, 170, 189, 107,
      192, 141, 119, 2, 169, 1'BPGI
1080 DATA 133, 198, 133, 204, 108, 46,
      3, 1, 2, 4, 8, 145'BLHI
1090 DATA 17, 157, 29, 147, 13, 20,
      148'BXYG
```

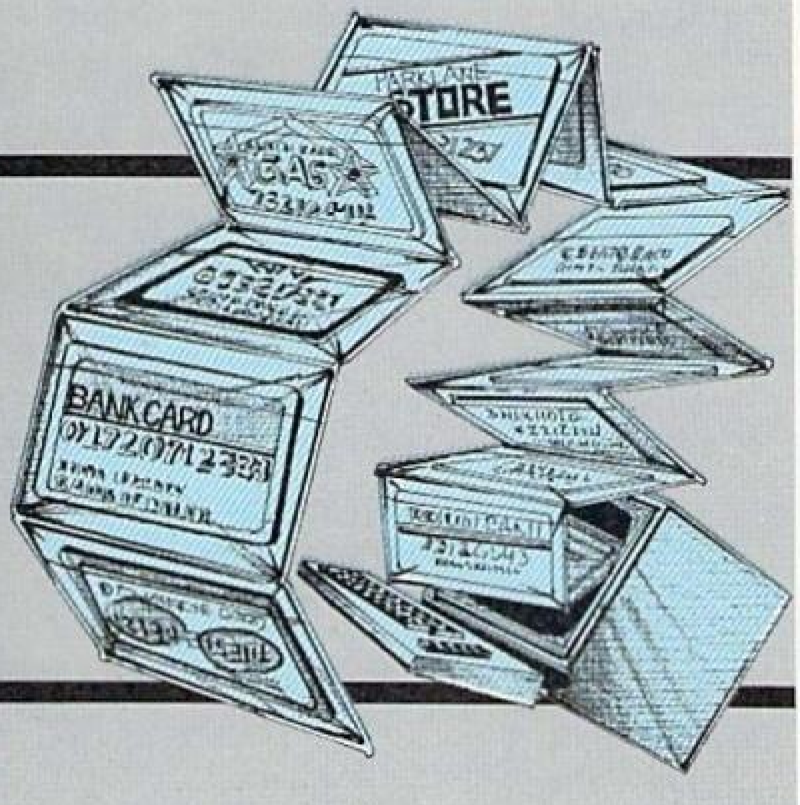
END

BY ROBERT E. KUPFER

Credit Card Control

for the Commodore 64

Let the Commodore 64 keep track of your credit cards.



Almost everyone has at least one bank, department store, and gasoline credit card. But what if you should lose your credit cards through theft or damage. Do you know where to write to notify the credit company? Do you know where all of those papers that came with your cards are? Probably not.

You can pay to have a private company notify all those credit card companies, or you can have your Commodore 64 keep track of your cards for you. Credit Card Control is a simple menu-operated, data-handling program that uses tape or disk sequential files to store credit card information. And should the need arise, the program prints out a form letter to each of the companies, notifying them of the loss and requesting a replacement card.

Credit Card Control has three options. The first option enters the names, account numbers, expiration dates, and the issuers' addresses of the cards, and displays them on-screen. After you have entered them all, you will be prompted for the file name and whether you are using tape or disk. If you have more than 17 cards on file, the display stops so none of the entries scroll off the screen. Press the RETURN key to continue the display.

The second option lets you add additional credit cards to your file or create a new file. The program is initially set up for 100 entries. If you need more, you can change the value of N in line 150 to reflect the desired number of entries. Since the standard Commodore screen has only 40 columns, you should try to keep the card names as short as possible.

To add information to an existing file, the program reads from tape or disk the contents of your current file. Starting with the next available entry number, you'll be prompted for the name, account number, expiration date, and mailing address to write to in case your cards are lost or damaged. When you have finished entering each entry, you'll be asked to verify it.

After making your additions or changes, you will notice that you are once again asked for a file name. This is because you cannot use the same file name twice, and the Save/Replace command is at times unreliable.

The third and final option requires a printer. Always be sure that you have the print head positioned at the top of the paper before actually printing. The program displays the name of each credit card it has on file, and as each is displayed, you're asked if you want that company notified. If your answer is no, the next card name is shown. If your answer is yes, you'll be asked if the card was lost or destroyed. You can then print a form letter to that company, notifying them of the loss or damage and requesting a new card.

The wording of the form letter can be changed to reflect your own style. After the letter is printed, the program will display the name of the next credit card on file and the process will repeat until all the letters you want have been printed. C

Before typing this program, read "How to Enter Programs" and "How to Use the Magazine Entry Program." The BASIC programs in this magazine are available on disk from Loadstar, P.O. Box 30007, Shreveport, LA 71130-0007, 1-800-831-2694.

Credit Card Control

```
100 POKE 53280,0:POKE 53281,0
    :POKE 646,5'DVVA
110 PRINT CHR$(147):FOR X=1 TO 10
    :PRINT:NEXT'HMOC
120 PRINT TAB(10)"CREDIT CARD
    CONTROL"'CDNE
130 PRINT TAB(10)"-------------------
    "'CDWD
140 FOR T=1 TO 1000:NEXT'EHQC
150 N=100:DIM D$(N),B$(N),E$(N),F$(N),
    L$(N):PRINT CHR$(147)'EPEK
160 FOR X=1 TO 6:PRINT:NEXT'FFLF
170 PRINT TAB(14)"*** MENU ***"
    :PRINT'DEYH
180 PRINT TAB(6)"1 - DISPLAY CREDIT
    CARD DATA"'CCFL
190 PRINT TAB(6)"2 - CREATE/ADD
    CREDIT CARD DATA"'CCDN
200 PRINT TAB(6)"3 - REPORT LOST OR
    DAMAGED CARDS"'CCCF
210 PRINT TAB(6)"4 - EXIT
    PROGRAM"'CCLC
220 PRINT:PRINT TAB(12)"[RVS]
```

64 USERS ONLY/CREDIT CARD CONTROL

```
    ENTER SELECTION[RVOFF]"'DEUF
230 GET A$:IF A$=""THEN 230'EIED
240 IF VAL(A$)>4 THEN PRINT
    :PRINT TAB(13)"1-4 ONLY"
    :FOR T=1 TO 1500:NEXT
    :GOTO 150'MVDN
250 ON VAL(A$)GOTO 280,500,690,
    1720'DUBG
260 ::'ACPC
270 REM DISPLAY FILE'BLVG
280 GOSUB 1240:GOSUB 1400:GOSUB 1350
    :PRINT CHR$(147):PRINT'GVBL
290 PRINT"CREDIT CARDS ON FILE TO DATE
    :":PRINT'CBEO
300 PRINT"[RVS]NAME[RVOFF]"TAB(16)"
    [RVS]ACCT. #[RVOFF]"TAB(30)"[RVS]
    EXP DATE[RVOFF]"'DGKG
310 PRINT"----"TAB(16)"-------"TAB(30)
    "--------"'DGAE
320 K1=0'BDSA
330 FOR X=1 TO N'DDXC
340 INPUT#1,D$(X)'BHQC
350 IF D$(X)="END"THEN 440'DICG
360 IF K1<17 THEN 400'DHRG
370 PRINT:PRINT TAB(8)"PRESS [RVS]
    RETURN[RVOFF] TO CONTINUE"
    :PRINT'EEJO
380 GET A$:IF A$<>CHR$(13)THEN
    380'GMGL
390 K1=0'BDSH
400 INPUT#1,B$(X),E$(X),F$(X),
    L$(X)'BACD
410 PRINT D$(X);TAB(15);B$(X);TAB(34);
    E$(X)'DACG
420 K1=K1+1'CFHC
430 NEXT X'BBRB
440 CLOSE 1:PRINT:PRINT"END OF FILE."
    :PRINT:PRINT TAB(12)"[RVS]
    PRESS M FOR MENU"'GIVO
450 GET A$:IF A$=""THEN 450'EIIH
460 IF A$<>"M"THEN 450'EFAH
470 CLR:GOTO 150'CETG
480 ::'ACPG
490 REM ENTER FILE'BJTK
500 X=1'BCIA
510 GOSUB 1240:GOSUB 1260:GOSUB 1440
    :PRINT CHR$(147):PRINT:PRINT'HWKI
520 PRINT"[RVS,SPACE11]
    USE END TO EXIT[SPACE12,RVOFF]"
    :PRINT'CBDJ
530 FOR X=X TO N'DDME
540 PRINT"ENTRY # [RVS]";X:PRINT'CDMH
550 PRINT"NAME OF CARD: [RVS]";
    :INPUT#2,D$(X):PRINT'DKPL
560 IF D$(X)="END"THEN 670'DIHJ
570 PRINT:PRINT"ACCOUNT #: [RVS]";
    :INPUT#2,B$(X):PRINT'ELFN
580 PRINT:PRINT"EXPIRATION DATE (EX.
    1/84): [RVS]";:INPUT#2,E$(X)
    :PRINT'ELXS
590 PRINT:PRINT"COMPANY P.O. OR
    STREET ADDRESS:"'CBIR
595 PRINT"[RVS]";:INPUT#2,F$(X)
    :PRINT'DKGQ
600 PRINT:PRINT"CITY, STATE & ZIP (DO
    NOT USE COMMA):"'CBJK
610 PRINT"[RVS]";:INPUT#2,L$(X)
    :PRINT'DKME
620 PRINT:PRINT"IS DATA CORRECT
    (Y/N)"'CBEI
630 GET Z$:IF Z$=""THEN 630'EIIH
640 IF LEFT$(Z$,1)="Y"THEN 660'EJFI
650 IF LEFT$(Z$,1)<>"Y"THEN X=X-1
    :PRINT:PRINT"[RVS]RE-ENTER DATA
    [RVOFF]"'JLTR
660 PRINT:PRINT:NEXT X'DDCI
670 CLOSE 2:GOTO 1450'CGTJ
680 ::'ACPI
690 PRINT CHR$(147):GOSUB 1440
    :PRINT'ELAN
700 PRINT"YOUR NAME: [RVS]";
    :INPUT#2,YN$:PRINT:PRINT'EJBI
710 PRINT"STREET OR POST OFFICE
    : [RVS]";:INPUT#2,MA$:PRINT
    :PRINT'EJTM
720 PRINT"CITY: [RVS]";:INPUT#2,CI$
    :PRINT:PRINT'EJOI
730 PRINT"STATE & ZIP CODE: [RVOFF]";
    :INPUT#2,SZ$:PRINT:PRINT'EJSN
740 PRINT"TODAY'S DATE (EX MAY 1 1985)
    : [RVS]";:INPUT#2,TD$:PRINT'DICP
750 CLOSE 2'BBJG
760 PRINT CHR$(147):PRINT'DGGK
770 GOSUB 1250:GOSUB 1400:GOSUB 1710
    :GOSUB 1350'ETBO
780 FOR X=1 TO N'DDXL
790 INPUT#1,D$(X)'BHQL
800 IF D$(X)="END"THEN 900'DIDG
810 INPUT#1,B$(X),E$(X),F$(X),
    L$(X)'BACI
820 PRINT"DO YOU WANT A REPORT FOR
    : ";D$(X)'BGRM
830 INPUT Q1$'BDRG
840 IF LEFT$(Q1$,1)="N"THEN 870'EKMK
850 PRINT"IS CARD LOST OR DISTROYED:";
    :INPUT W$:PRINT:PRINT'EGLR
860 GOSUB 920'BDOJ
870 IF ST=0 THEN NEXT X'EEXM
880 IF ST=64 THEN 900'DHQN
890 IF ST<>0 AND ST<>64 THEN
    PRINT"ERROR...";ST:CLOSE 1
    :END'KNLW
900 CLOSE 1:PRINT"END OF FILE"
    :FOR T=1 TO 1000:NEXT:CLR
    :GOTO 150'IPLN
910 ::'ACPE
920 REM PRINTING ROUTINE'BPGK
930 SN$="SINCERELY,"'BDPK
940 OPEN 4,4'BDAI
950 PRINT#4'BBDI
960 PRINT#4,TAB(80-LEN(MA$));MA$'EOMO
970 PRINT#4,TAB(79-LEN(CI$)-LEN(SZ$));
    CI$;" ";SZ$'GYHT
980 PRINT#4,TAB(80-LEN(TD$));TD$'EOHQ
```

```
990 PRINT#4,D$(X)'BHJO
1000 PRINT#4,F$(X)'BHLU
1010 PRINT#4,L$(X)'BHRV
1020 PRINT#4'BBDU
1030 PRINT#4,"RE: ACCOUNT # ";
     B$(X)'BIXB
1040 PRINT#4'BBDW
1050 PRINT#4,"DEAR SIR:"'BCYB
1060 PRINT#4'BBDY
1070 PRINT#4,TAB(5)"IN REGARD TO THE
     ABOVE ACCOUNT,";'CFYK
1075 PRINT#4," I AM REPORTING THAT MY
     CARD WAS"'BCSO
1080 PRINT#4'BBDB
1090 PRINT#4,W$;" ON OR ABOUT THE
     ABOVE DATE."'BFOK
1100 PRINT#4:PRINT#4'CDJU
1110 PRINT#4,TAB(5)"PLEASE TAKE ANY
     NECESSARY ACTION";'CFCG
1115 PRINT#4," TO INSURE THAT THERE
     IS NO"'BCOI
1120 PRINT#4'BBDV
1130 PRINT#4,"UNAUTHORIZED USE OF
     THIS CARD,";'BDKG
1135 PRINT#4," AND PLEASE ISSUE A
     REPLACEMENT AS"'BCNL
1140 PRINT#4'BBDX
1150 PRINT#4,"SOON AS POSSIBLE."'BCSE
1160 PRINT#4:PRINT#4'CDJB
1170 PRINT#4,TAB(5)"PLEASE CONTACT ME
     IF";'CFOI
1175 PRINT#4," ADDITIONAL INFORMATION
     IS NEEDED."'BCKQ
1180 FOR X=1 TO 4:PRINT#4:NEXT'FGKG
1190 PRINT#4,TAB(70-LEN(SN$));SN$'EOYI
1200 FOR X=1 TO 4:PRINT#4:NEXT'FGKY
1210 PRINT#4,TAB(75-LEN(YN$));YN$'EOQB
1220 PRINT#4:CLOSE 4'CDRX
1230 RETURN'BAQX
1240 PRINT CHR$(147):PRINT'DGGC
1250 PRINT:INPUT"[RVS]FILE NAME[RVOFF]
     ";FI$:RETURN'DGCG
1260 PRINT:PRINT"(A)DD TO EXISTING
     FILE"'CBNI
1265 PRINT"(N)EW FILE":PRINT"(R)ETURN
     TO MENU"'CBUO
1270 GET Z$:IF Z$=""THEN 1270'EJHG
1280 IF LEFT$(Z$,1)="N"THEN
     RETURN'FGFH
1290 IF LEFT$(Z$,1)="A"THEN 1620'EKBI
1300 IF LEFT$(Z$,1)="R"THEN CLR
     :GOTO 150'GKGC
1310 IF LEFT$(Z$,1)<>"N"AND LEFT$(Z$,
     1)<>"A"AND LEFT$(Z$,
     1)<>"R"THEN PRINT'OSVL
1320 PRINT"ENTER (A) (N) OR (R)
     ONLY...":FOR T=1 TO 1000
     :NEXT'FIIJ
1330 PRINT CHR$(147):PRINT
     :GOTO 1260'ELVD
1340 RETURN'BAQA
1350 GOSUB 1730'BEMC
1360 GET Z$:IF Z$=""THEN 1360'EJHG
1370 IF Z$="T"THEN OPEN 1,1,0,FI$
     :RETURN'FMFI
1380 IF Z$="D"THEN OPEN 1,8,8,FI$+",S,
     R":RETURN'GMTL
1390 IF Z$<>"T"AND Z$<>"D"THEN
     1360'HIJM
1400 PRINT:PRINT"[RVS,SPACE2]
     INSERT SOURCE FILE AND PRESS
     RETURN[SPACE2,RVOFF]"'CBJJ
1410 GET Z$:IF Z$=""THEN 1410'EJDC
1420 IF Z$<>CHR$(13)THEN 1410'FKKE
1430 RETURN'BAQA
1440 OPEN 2,0:RETURN'CETC
1450 REM SAVE FILE'BIVE
1460 GOSUB 1250:GOSUB 1400
     :GOSUB 1560'DOPH
1470 FOR X=1 TO N'DDXG
1480 PRINT#1,D$(X):PRINT#1,B$(X)
     :PRINT#1,E$(X):PRINT#1,F$(X)
     :PRINT#1,L$(X)'FOPQ
1490 IF D$(X)="END"THEN 1510'DJYK
1500 NEXT X'BBRX
1510 CLOSE 1'BBIY
1520 PRINT CHR$(147):PRINT
     :PRINT"DO YOU WANT A BACKUP COPY
     (Y/N)?"'EHVM
1530 GET Z$:IF Z$=""THEN 1530'EJGF
1540 IF LEFT$(Z$,1)="Y"THEN 1460'EKCG
1550 CLR:GOTO 150'CETE
1560 GOSUB 1730'BEMF
1570 GET Z$:IF Z$=""THEN 1570'EJKJ
1580 IF Z$="T"THEN OPEN 1,1,1,FI$
     :RETURN'FMGL
1590 IF Z$="D"THEN OPEN 1,8,8,+"0
     :"+FI$+",S,W":RETURN'IMKQ
1600 IF Z$<>"T"AND Z$<>"D"THEN
     1570'HIMG
1610 ::'ACPA
1620 REM READ FILE'BICD
1630 GOSUB 1400:GOSUB 1350'CJAE
1640 PRINT CHR$(147)'CFBF
1650 FOR X=1 TO N'DDXG
1660 INPUT#1,D$(X),B$(X),E$(X),F$(X),
     L$(X)'BGNL
1670 IF D$(X)="END"AND ST=64 THEN
     1700'FNJN
1680 IF ST=0 THEN NEXT X'EEXK
1690 IF ST<>0 AND ST<>64 THEN
     PRINT"ERROR..."ST:CLOSE 1
     :END'KMCT
1700 CLOSE 1:RETURN'CCCB
1710 PRINT"[RVS,SPACE3]
     TURN ON PRINTER AND PRESS RETURN
     [SPACE4,RVOFF]":GOSUB 1410
     :RETURN'DGTO
1720 END'BACC
1730 PRINT:PRINT"[RVS]T[RVOFF]APE OR
     [RVS]D[RVOFF]ISK":PRINT
     :RETURN'EDTK
```

END

BY PAUL MONTOGNESE

Screen Grabber

for the Commodore 64

Screen Grabber creates the BASIC code necessary to print your custom screen.

You design a custom screen with characters and colors available on your keyboard, and Screen Grabber creates the BASIC code necessary to print it. Screen Grabber is poked into locations 52534 thru 53247 by the BASIC loader program. You are given the options of APPEND or NEW. APPEND will add PRINT statements to a BASIC program already in memory or form a brand new program if none is present.

The NEW option causes the generated code to be the only lines in the BASIC program area. In other words, this option forces a BASIC NEW before adding the code to recreate the current screen.

You are then asked for a line number increment. Simply press RETURN to select the default option of 10. Otherwise, you may key any number from 1 to 255. This value is used in creating the line numbers for the generated BASIC code.

Screen Grabber is then enabled. At this point, you can do pretty much anything you would normally want to do. Clear the screen, load a program, run, use the screen editor to edit or create lines, and so on. But Screen Grabber will take over the moment you press the RESTORE key.

The first thing you will see is each of the 25 vertical screen lines going blank, top line first. This is a progress report showing you that PRINT statements are being built. When all the code for the current screen has been generated (just a few seconds), you will see a list of the program lines created and you are then put back in BASIC READY mode.

The code can then be run, saved, or edited just as if you had keyed it yourself. You may leave the code intact or make it more compact by adding TAB, SPC, or other refinements where appropriate.

Screen Grabber may be disabled at any time by holding the CTRL key down while pressing RESTORE. A message will appear on the screen telling you that SYS 52534 will re-enable Screen Grabber. You can simply press RETURN over this line to accomplish the reactivation of Screen Grabber.

The major use for Screen Grabber is to assist in the creation of application screens. However, it may also be used as a rudimentary word processor. First select the APPEND option. Then key a screen and press RESTORE at the last vertical line. Key the next screen, press RESTORE, and so on. When you're done, edit the PRINT statements to remove any unwanted controls such as CLR/HOME and color changes. Then add OPEN4,4:CMD4 to the first line of the program, add PRINT#4,:CLOSE4 to the last line, and then run to print out a hard copy of the screens you've created.

Remember, the program lines created are standard BASIC, so you can edit them any way you like. If you accidentally press RESTORE before completing your screen, you can recover simply by keying RUN and RETURN. This will cause the screen to reappear and then be made available for further refinement. All you need to account for are the program lines that you don't want if you are in AP-

PEND mode. Key NEW after RUN or delete the lines individually, whatever is easier.

Concluding Notes

The code generated by Screen Grabber prints a full screen and sets the cursor to the HOME position.

When using the screen editor, you must account for scrolling that occurs if you key the last character in the last line directly. There are two ways around this. Poke to screen/color memory directly (e.g., POKE 2023,1:POKE56295,0 for a black A) or use the INSERT key judiciously. When Screen Grabber takes over, it will generate code to recreate the screen without scrolling.

When keying characters onto the screen, you need to be concerned with Syntax errors caused by pressing RETURN. Use SHIFT/RETURN instead, or take advantage of a special feature built into Screen Grabber. Just do a POKE 115,96 in direct mode and you will shut off all BASIC command processing and be able to use RETURN over any kind of line. When the screen is to your liking, press RESTORE and Screen Grabber will generate the BASIC program code and also restore things to normal before placing you back in READY mode.

Screen Grabber changes double quotes to single quotes because double quotes interfere with the operation of the PRINT statement. If you absolutely need them on your screen, then edit the PRINT statements and use CHR$(34) to print a double quote or assign the value to a variable (Q$=CHR$(34)) and then PRINT Q$ to get a double quote on the screen.

The loader program does a NEW after setting up the machine language. Therefore, it is absolutely critical that you save before doing the first run. ■

Before typing these programs, read "How to Enter Programs," and "How to Use the Magazine Entry Program." The BASIC programs in this magazine are available on disk from Loadstar, P.O. Box 30007, Shreveport, LA 71130-0007, 1-800-831-2694.

Screen Grabber BASIC Loader

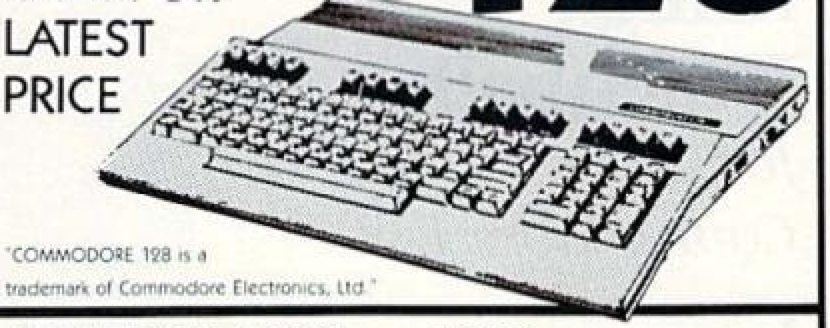
```
5 FOR I=1 TO 36:T$=T$+"[CMDR P]"
   :B$=B$+"[CMDR T]":NEXT:FOR I=1 TO 13
   :D$=D$+"[DOWN]":NEXT'OBLS
10 R$=CHR$(13):XR=781:CL=59903
   :POKE 53280,11:POKE 53281,1'GMPI
15 PRINT"[UPPER CASE,CLEAR,GRAY1,
   SHFT POUND,SPACE7,RVS,CMDR D,RVOFF,
   CMDR D,CMDR F,RVS,CMDR F,CMDR D,
   RVOFF,CMDR D,CMDR F,RVS,CMDR F,
   RVOFF,CMDR K,CMDR D,CMDR F,RVS,
   CMDR F,RVOFF,CMDR K,CMDR D,CMDR I,
   RVS,CMDR V,RVOFF,CMDR K,CMDR D,
   CMDR I,RVS,CMDR V,RVOFF,CMDR K,
   CMDR C,CMDR K,RVS,CMDR K,RVOFF,
   SPACE7,CMDR *]";'BBDD
20 PRINT SPC(8)"[RVS,CMDR C,RVOFF,
   CMDR C,RVS,CMDR I] [RVOFF,CMDR K,
   RVS,CMDR K,SPACE2,RVOFF,CMDR K,
   CMDR C,CMDR V,RVS,CMDR V,RVOFF,
   CMDR K,CMDR C,RVS,CMDR F] [RVOFF,
   CMDR K,CMDR C,RVS,CMDR F] [RVOFF,
   CMDR K,SPACE2,RVS,CMDR K]"'CCOQ
25 PRINT TAB(8)"[RVS,CMDR D,CMDR F,
   RVOFF,CMDR K,RVS,CMDR K,RVOFF,
   CMDR K,RVS,CMDR K,CMDR D,CMDR F,
   RVOFF,CMDR K,CMDR D,CMDR C,RVS]
   [RVOFF,CMDR K,RVS,CMDR K,SPACE2,
   RVOFF,CMDR K,RVS,CMDR K,SPACE2,
   RVOFF,CMDR K,RVS,CMDR K,RVOFF,
   CMDR F,RVS,CMDR K]"'CCWW
30 PRINT TAB(7)"[RVS,SHFT POUND]
   [RVOFF,CMDR I2,RVS,SPACE2,RVOFF,
   CMDR I2,RVS] [CMDR C,CMDR V,CMDR C,
   CMDR V,CMDR C,RVOFF,CMDR I2,RVS,
   CMDR V,CMDR C,RVOFF,CMDR I2,RVS,
   CMDR V,CMDR C,CMDR V,CMDR C,CMDR V,
   CMDR *]"'CCAT
35 PRINT TAB(6)"[RVS,SHFT POUND,
   SPACE26,CMDR *]"'CCSK
40 PRINT TAB(6)"[RVS,CMDR D,RVOFF,
   CMDR D,CMDR F,RVS,CMDR F,RVOFF,
   CMDR K,CMDR D,CMDR F,RVS,CMDR F]
   [RVOFF,CMDR V,CMDR C,RVS] [RVOFF,
   CMDR K,CMDR D,CMDR F,RVS,CMDR F,
   RVOFF,CMDR K,CMDR D,CMDR F,RVS,
   CMDR F,RVOFF,CMDR K,CMDR D,CMDR I,
   RVS,CMDR V,RVOFF,CMDR K,CMDR D,
   CMDR F,RVS,CMDR F]"'CCNY
45 PRINT TAB(6)"[CMDR K,RVS,CMDR K,
   CMDR I,CMDR F,RVOFF,CMDR K,CMDR C,
   CMDR V,RVS,CMDR V,RVOFF,CMDR K,
   CMDR C,CMDR V,RVS,CMDR K,RVOFF,
   CMDR K,CMDR C,CMDR V,RVS,CMDR V,
   RVOFF,CMDR K,CMDR C,CMDR V,RVS,
   CMDR V,RVOFF,CMDR K,CMDR C,RVS,
   CMDR F] [RVOFF,CMDR K,CMDR C,
   CMDR V,RVS,CMDR V]"'CCGE
50 PRINT TAB(6)"[CMDR K,RVS,CMDR K,
   RVOFF,CMDR K,RVS,CMDR K,RVOFF,
   CMDR K,CMDR D,CMDR C,RVS] [RVOFF,
   CMDR K,RVS,CMDR K,RVOFF,CMDR K,RVS,
   CMDR K,RVOFF,CMDR K,RVS,CMDR K,
   RVOFF,CMDR K,RVS,CMDR K,RVOFF,
   CMDR K,RVS,CMDR K,RVOFF,CMDR K,RVS,
   CMDR K,RVOFF,CMDR K,RVS,CMDR K,
   SPACE2,RVOFF,CMDR K,CMDR D,CMDR C,
   RVS] "'CCBA
55 PRINT TAB(6)"[RVS] [RVOFF,CMDR I2,
   RVS] [CMDR C,CMDR V,CMDR C,CMDR V,
   CMDR C,CMDR V,CMDR C,CMDR V,CMDR C,
   RVOFF,CMDR I2,RVS] [CMDR C,RVOFF,
   CMDR I2,RVS] [CMDR C,RVOFF,CMDR I2,
   RVS,CMDR V,CMDR C,CMDR V,CMDR C,
   CMDR V,DOWN]"R$"[SPACE2]"T$'CGUD
60 PRINT"[SPACE2,RVS] SETTING UP
   [SHFT *] COUNT DOWN TO ZERO[SPACE4]
   "R$"[SPACE2]"B$'BEQN
65 PRINT LEFT$(D$,11)TAB(38)"[RVS,
   SHFT POUND,UP]"R$"[RVS,INST,CMDR *,
   HOME]"D$"[UP2]":H=64:L=48:T=10
   :TZ=20'HGRW
70 S=7:X=16:N=1:E=53247:I=52534
   :FOR J=34 TO 1 STEP-1
   :J$=STR$(J)'MKPS
75 IF J<T THEN J$=" "+J$'FGSM
80 PRINT"[UP]"TAB(34)"[RVS]"J$'CFVG
85 FOR I=I TO I+TZ:READ A$:A=ASC(A$)
```

```
   :B=ASC(RIGHT$(A$,N))'KYXV
90 P=X*((A-L)+S*(A>H))+B-L+S*(B>H)
   :POKE I,P:NEXT:NEXT'OBHU
95 GOSUB 165:TG$="[SHFT U,SHFT *,
   SHFT I]":BG$="[SHFT J,SHFT *,
   SHFT K]"'DLMT
100 PRINT"[UP3]"R$TAB(7)TG$SPC(16)
    TG$R$TAB(7)"[SHFT -,RED]A[GRAY1,
    SHFT -]PPEND OR ALWAYS [SHFT -,
    RED]N[GRAY1,SHFT -]EW?"'ERDN
105 PRINT TAB(7)BG$SPC(16)BG$'DLSE
110 GET A$:IF A$=""THEN 110'EIBA
115 IF A$="N"THEN M$="NEW":T=11:V=32
    :GOTO 125'HQAK
120 M$="APPEND":T=9:V=44'DJED
125 GOSUB 165:PRINT"[UP3]"TAB(T)"[RED]
    "M$;:P=POS(.):PRINT"[GRAY1]
     OPTION SELECTED"'GPHP
130 POKE 52590,V:INPUT"[DOWN,RIGHT5]
    LINE INCREMENT[SPACE3]10[LEFT4]";
    L$:POKE XR,12:SYS CL'EUHM
135 L=VAL(L$):L$=STR$(L)
    :IF L<1 OR L>255 THEN PRINT"[UP2]
    ";:GOTO 130'LXQQ
140 PRINT"[UP2]"TAB(P-LEN(L$))"[RED]
    "L$"[GRAY1] IS THE INCREMENT"
    :POKE 52924,L:SYS 53130'GWWN
145 PRINT"[SPACE2]"T$R$"[SPACE2,RVS]
    [SHFT *4]SCREEN GRABBER NOW
    ENABLED[SHFT *4] "R$"[SPACE2]
    "B$'BIKU
150 PRINT"[SPACE2]"T$R$"[SPACE2,RVS]
     PRESS [RESTORE][SPACE6]
    TO ACTIVATE[SPACE3]"'BEOL
155 PRINT"[SPACE2,RVS,SPACE7]
    [CTRL/RESTORE] TO DISABLE[SPACE4]
    "'BAUO
160 PRINT"[SPACE2,RVS,SPACE2]KEY
    [SPACE2]SYS (52534)[SPACE4]
    TO RE-ENABLE[SPACE2]"
    :PRINT"[SPACE2]"B$;:NEW'DFRM
165 FOR I=9 TO 12:POKE XR,I:SYS CL
    :NEXT:RETURN'HOAN
170 DATA 20,8A,CF,4C,95,CF,48,8A,48,
    98'BEMI
175 DATA 48,A5,91,C9,FB,D0,1A,A9,47,
    A2'BEGN
180 DATA FE,8D,18,03,8E,19,03,20,98,
    CF'BEKJ
185 DATA AD,86,02,8D,87,02,A9,00,85,
    CF'BEDO
190 DATA 4C,81,EA,A9,C1,A2,FE,8D,18,
    03'BESK
195 DATA 8E,19,03,20,59,A6,20,44,A6,
    A2'BEIP
200 DATA 70,9A,A9,E6,85,73,20,33,A5,
    A5'BELC
205 DATA 22,48,85,7A,AA,A5,23,48,85,
    7B'BEOH
210 DATA E4,2B,D0,07,C5,2C,D0,03,88,
    F0'BEDD
215 DATA 18,C6,7B,C8,88,20,73,00,AA,
    D0'BESI
220 DATA FA,B1,7A,C5,22,D0,F4,C8,B1,
    7A'BEBE
225 DATA C5,23,D0,EC,C8,B1,7A,85,14,
    C8'BEEJ
230 DATA B1,7A,85,15,AD,02,03,48,AD,
    03'BEGF
235 DATA 03,48,A9,17,A2,CF,8D,02,03,
    8E'BEVK
240 DATA 03,03,A9,FF,A2,06,95,F9,CA,
    10'BEIG
245 DATA FB,78,A5,CC,D0,0C,C6,CF,D0,
    08'BEXL
250 DATA A5,CE,AE,87,02,20,1C,EA,A5,
    F9'BEFH
255 DATA D0,02,85,FF,A2,00,86,F9,A6,
    FA'BEFM
260 DATA E8,E0,19,D0,03,4C,28,CF,86,
    FA'BEKI
265 DATA 20,F0,E9,20,24,EA,20,B8,CE,
    AA'BECN
270 DATA A0,27,B1,D1,C9,20,D0,1A,88,
    10'BEBJ
275 DATA F7,20,D8,CE,50,03,4C,9E,CE,
    C9'BEDO
280 DATA 18,D0,03,4C,31,CF,8E,01,02,
    20'BEJK
285 DATA 0D,CF,D0,BE,84,9B,A5,FA,C9,
    17'BEGP
290 DATA D0,06,C0,27,D0,12,E6,FE,C9,
    18'BEJL
295 DATA D0,0C,C0,27,F0,04,A0,FF,D0,
    0B'BERQ
300 DATA A0,00,F0,07,98,A0,FF,C9,27,
    D0'BEGD
305 DATA 02,A2,3B,86,F9,20,D8,CE,C8,
    B1'BEDI
310 DATA D1,C9,20,F0,13,B1,F3,29,0F,
    C5'BEDE
315 DATA FC,F0,09,85,FC,AA,BD,DA,E8,
    20'BEQJ
320 DATA E2,CE,B1,D1,29,80,C5,FF,F0,
    07'BETF
325 DATA 85,FF,49,92,20,E2,CE,24,FD,
    30'BEWK
330 DATA 05,A9,94,20,E2,CE,B1,D1,29,
    7F'BEOG
335 DATA A2,06,CA,DD,9F,CF,90,FA,5D,
    A5'BESL
340 DATA CF,20,E2,CE,C4,9B,D0,BA,24,
    FD'BEJH
345 DATA 30,08,A0,07,20,1D,CF,4C,5F,
    CF'BEPM
350 DATA A9,22,9D,02,02,A5,F9,E8,9D,
    02'BEBI
355 DATA 02,20,07,CF,A6,FA,E0,18,F0,
    03'BETN
360 DATA 20,FF,E9,4C,DE,CD,18,A5,14,
    69'BEFJ
365 DATA 0A,85,14,90,02,E6,15,A9,3F,
    A2'BEYO
370 DATA 22,8D,00,02,8E,01,02,A9,00,
```

SCREEN GRABBER

```
    85'BEFK
375 DATA FB,A2,02,85,7A,86,7B,60,B8,
    A5'BEQP
380 DATA FA,D0,FA,38,A9,93,24,FD,A6,
    FB'BEIL
385 DATA E0,42,D0,18,48,98,48,A9,22,
    9D'BEGQ
390 DATA 02,02,E8,A9,3B,9D,02,02,20,
    07'BEWM
395 DATA CF,20,B8,CE,AA,68,A8,68,9D,
    02'BECR
400 DATA 02,E8,86,FB,60,E8,A9,00,9D,
    02'BECE
405 DATA 02,BA,8E,18,CF,A2,FF,9A,4C,
    9F'BEJJ
410 DATA A4,A2,00,9A,60,A0,02,B9,AB,
    CF'BETF
415 DATA 20,E2,CE,88,10,F7,30,E0,20,
    B8'BENK
420 DATA CE,A5,9B,C9,27,F0,05,20,1B,
    CF'BEPG
425 DATA D0,29,24,FE,30,11,A2,FF,E8,
    BD'BEPL
430 DATA B8,CF,9D,00,02,D0,F7,20,0D,
    CF'BEKH
435 DATA 20,B8,CE,E6,FD,A0,05,B9,B2,
    CF'BEWM
440 DATA 20,E2,CE,88,D0,F7,84,9B,84,
    FF'BEAI
445 DATA 4C,4D,CE,68,8D,03,03,68,8D,
    02'BEEN
450 DATA 03,68,85,60,68,85,5F,A2,18,
    20'BEUJ
455 DATA FF,E9,A9,13,20,D2,FF,AD,21,
    D0'BEHO
460 DATA 29,0F,CD,86,02,D0,03,EE,86,
    02'BETK
465 DATA 20,8A,CF,4C,C3,A6,A9,3C,A2,
    CD'BERP
470 DATA 8D,18,03,8E,19,03,60,A9,CB,
    2C'BEWL
475 DATA A9,E3,A0,CF,4C,1E,AB,00,20,
    22'BETQ
480 DATA 23,40,60,40,00,05,00,20,C0,
    3B'BERM
485 DATA 22,13,22,3F,3A,3B,22,22,3F,
    3A'BEGR
490 DATA 22,91,50,CF,32,34,31,2C,50,
    C5'BEBN
495 DATA 28,32,34,31,29,4F,52,31,32,
    38'BEPS
500 DATA 00,53,43,52,45,45,4E,20,47,
    52'BEKF
505 DATA 41,42,42,45,52,20,45,4E,41,
    42'BEFK
510 DATA 4C,45,44,0D,00,53,59,53,28,
    35'BEIG
515 DATA 32,35,33,34,29,12,3A,52,45,
    4D'BEAL
520 DATA 20,54,4F,20,52,45,2D,45,4E,
    41'BEQH
525 DATA 42,4C,45,0D'BLRI
```

END



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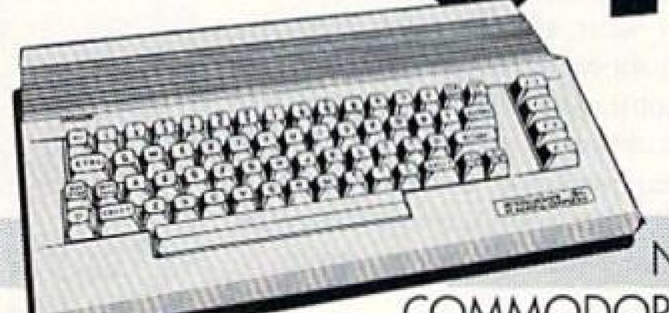

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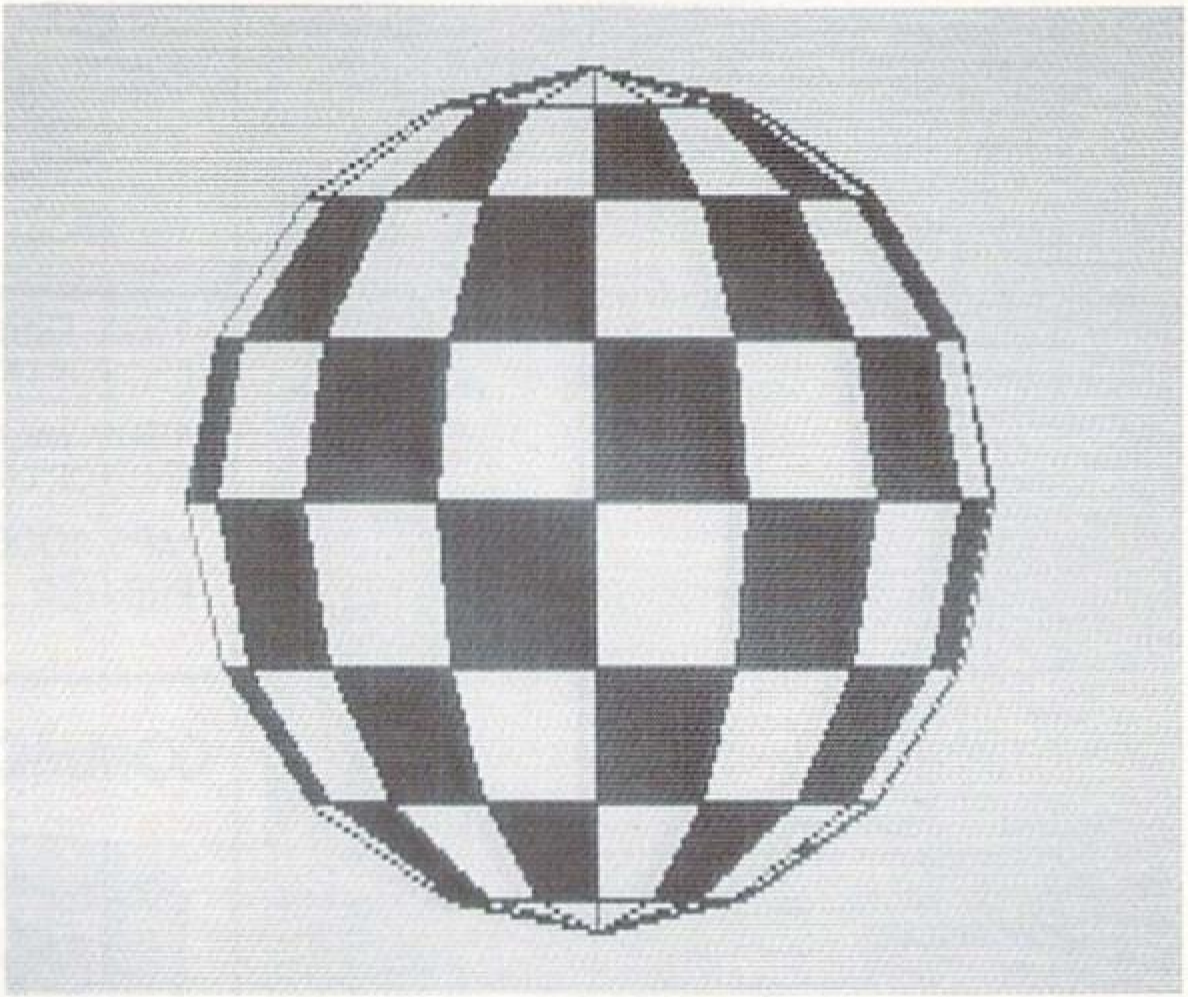
BY IAN ADAM

Amiga Beachball

for the Commodore 128



Program the famous Amiga beachball on your 128.

Computer chips are made of silicon, and silicon comes from sand. With that in mind, it is appropriate that Commodore chose a bouncing beachball to represent its great new computer, the Amiga. The ball represents the synthesis of many features—high-resolution graphics, quick processing, and multitasking. The red and white ball is prominently featured in advertising for the computer, spinning and bouncing its way across the screen and into the hands of children.

The accompanying programs demonstrate that same effect on the Commodore 128, showing that dynamic graphics and multitasking are not restricted to the Amiga alone. As well as the spin-and-bounce demonstration, the beachball can be used in other programs, as illustrated by an amusing game of beach tennis.

The Program

High-speed graphics manipulation has been available on the 128 all along, where it goes by the much simpler name of sprites. It doesn't rival the Amiga, but the capabilities are there.

Multitasking on the 128 is accomplished through the interrupt routine, a machine-language program that interrupts your program 60 times each second to carry out routine tasks such as reading the keyboard and updating the clock. Serving these activities while another program continues to run is the essence of multitasking. In addition, both the video chip and the sound synthesizer are co-processors that act independently with minimal instruction from the central processor.

Drawing the beachball is very simple with the 128's graphics capabilities—it requires only about six lines of code to draw the ball, a little more to color it in. However, the animation is a different matter. It would take much too long to redraw the ball continually as it rotates, and even the Amiga does not use that approach. Instead, the method is to prepare and save images of the ball in advance, and switch them rapidly into view to give the illusion of rotation. This is easily done on the 128 by changing the data pointers for the sprites as part of the interrupt routine.

This program for the 128 consists of four parts. First, there is a subroutine in lines 1500 through 1980 to draw the ball. This section can be used to draw a beachball in any size, shape, or spin angle, anywhere on the high-resolution screen.

In the second part, lines 500 to 770 build a disk file. Six rotated views of the ball are created using the subroutine. These are transferred into a string variable with SSHAPE, then saved to disk in sprite format.

In the third part, a machine-language routine is added to the disk file. This routine will lock the eight sprites together into one cohesive object, so you just move sprite one and the rest follow along. This routine also spins the ball every 8 jiffies.

The final part of the program loads the disk file and displays the beachball. Using BASIC, it can spin the ball or bounce it just like the Amiga. The multitasking part is demonstrated in the way you can use the ball with other programs. To demonstrate this, I have included a simple game of beach tennis within the Amiga Beachball program.

Carefully type in the program. Be sure to save a copy before you run it.

The first menu gives you the option to draw a beachball of any size. Experiment with this as you wish. When finished, press the number three to create a disk file. This takes a few minutes, but you only do it once. Next time you run the program, you can press the number four at the first menu to load the disk file you created before. The second menu gives the choice of spinning or bouncing the ball, or playing beach tennis.

After the program quits, the ball keeps right on spinning. It may continue to do this even if you run another program, since it is now part of the interrupt routine.

The beach tennis game is a light-hearted illustration of how the spinning ball can be combined with another program. BASIC is altogether too slow to write a good ping-pong style game, but this one

128 USERS ONLY/AMIGA BEACHBALL

comes pretty close. The left-hand player uses the Q and Z keys to move the paddle up or down, while the right-hand player uses the P and / keys. You can easily change the program to use other keys, or to add joysticks.

Here are the instructions to use the spinning ball in your own 128 program.

GRAPHIC1:GRAPHIC0 will reserve the buffer
BLOAD".BEACHBALL",B0
SYS11264 will enable spinning
POKE11430,1 to spin to the left, or poke with 0 to spin right
Move the ball using MOVSPR 1,X,Y
To terminate the ball, hold down RUN/STOP and tap the RESTORE key.

One caution: The 128's sprites and program are stored in the high-resolution screen area. Be sure to disable the ball before clearing the graphics screen.

Before typing these programs, read "How to Enter Programs," and "How to Use the Magazine Entry Program." The BASIC programs in this magazine are available on disk from Loadstar, P.O. Box 30007, Shreveport, LA 71130-0007, 1-800-831-2694.

Amiga Beachball

```
100 COLOR 0,16:COLOR 1,3'CIPX
110 PRINT"[CLEAR,RED] AMIGA BEACHBALL
    FOR C128"'BALD
120 PRINT" BY IAN ADAM[DOWN]"'BACA
130 PRINT" CHOOSE:"'BALA
140 PRINT" 1. STANDARD BALL"'BAJD
150 PRINT" 2. CUSTOM BALL"'BAPE
160 PRINT" 3. ANIMATE- RUN ONCE TO
    WRITE DISK FILE"'BAQL
170 PRINT" 4. USE EXISTING DISK
    FILE"'BAHJ
180 PRINT" 5. QUIT"'BAHF
190 PRINT"[DOWN2]"'BALE
200 :'ABHV
210 GET KEY A$'CCEX
220 ON VAL(A$) GOSUB 300,400,500,800,
    2200'DYVE
230 GET KEY A$'CCEA
240 GRAPHIC 0'BBOB
250 RUN'BAMB
260 :'ABHC
300 H=56:W=80'CHQA
310 CX=160:CY=100'CLCB
320 GOTO 1500'BEDA
330 :'ABHA
400 INPUT"X-RADIUS 20-159";W'BCQC
410 INPUT"Y-RADIUS 20-99";H'BCGD
420 PRINT"BALL MUST BE ON-SCREEN
    :"'BAMG
430 INPUT"X-CENTRE 20-300";CX'BDPF
440 INPUT"Y-CENTRE 20-190";CY'BDYG
450 INPUT"ROTATION 0-45";SA'BDGH
460 GOTO 1500'BEDF
470 :'ABHF
500 H=17:W=47'CHQC
510 CX=160:CY=100'CLCD
520 DOPEN#1,".BEACHBALL,P",W'BGYG
530 GOSUB 2100'BEED
540 PRINT#1,CHR$(0)CHR$(32);'DKTG
550 :'ABHE
600 FOR SA=0 TO 37.5 STEP 7.5'EKUE
610 GOSUB 1500'BEHC
620 :'ABHC
630 FOR I=112 TO 184 STEP 24
    : REM SAVE BALL ON DISK'FYIM
640 SSHAPE A$,I,79,I+23,99'COXI
650 PRINT#1,LEFT$(A$,63)'CJII
660 SSHAPE A$,I,100,I+23,120'CQOK
670 PRINT#1,LEFT$(A$,63)'CJIK
680 NEXT'BAEI
690 NEXT'BAEJ
700 : REM MACHINE CODE:'BNTF
710 FOR I=1 TO 167'DFNE
720 READ A :T=T+A'DFUG
730 PRINT#1,CHR$(A);'CGLG
740 NEXT'BAEF
750 GRAPHIC 0'BBOH
760 IF T-18987 THEN COLLECT
    :PRINT"DATA ERROR!":STOP'GIQP
770 CLOSE 1'BBII
780 :'ABHJ
800 GOSUB 2100'BEED
810 TRAP 800'BDKE
820 MOVSPR 1,0#0'BGCF
830 MOVSPR 1,200,70'BJIH
840 PRINT"[CLEAR,RED] BEACH BALL GAMES
    :[DOWN]"'BAVL
850 PRINT"1. SPIN BALL"'BAAK
860 PRINT"2. BOUNCE BALL"'BACM
870 PRINT"3. BEACH TENNIS"'BAGN
880 PRINT"4. END[DOWN]"'BAIM
890 :'ABHL
900 IF PEEK(11264)-169 OR PEEK(46)<64
    THEN GRAPHIC 1:GRAPHIC 0
    :BLOAD".BEACHBALL"'KVER
910 :'ABHE
920 GET KEY A$:SCNCLR'DDHI
930 FOR I=1 TO 8:SPRITE I,1,3,,,1
    :NEXT'FPLM
940 SYS 11264 :REM SPIN BALL'COKL
950 :'ABHI
960 IF A$="3" THEN BT=6
    :GOTO 1000'FKBO
970 IF A$="4" THEN 2200'DGPN
980 IF A$<>"2" THEN RUN 800'FFEP
990 :'ABHM
1000 INPUT"[RIGHT2]SPEED 1 TO 4";
     D'BCGW
1010 :'ABHT
1020 MOVSPR 1,90#D'BHXW
1030 X0=23+BT:XM=248-BT:YM=174'FUYE
1040 RX=4566:RY=4567:RD=11430'DVZE
1050 Y=70'BDNY
1060 PL=5:PR=5'CHTC
1070 P$=" [DOWN,LEFT,RVS] [DOWN,LEFT]
      [DOWN,LEFT,RVOFF] "'BCME
1080 TEMPO 40:PLAY"O1T3"'CFXE
1090 IF BT THEN CHAR,16,24,
     "<SCORE>"'DJUH
1100 A(0)=270:A(1)=90'COLX
1110 :'ABHU
1120 DO'BAJV
1130 IF E THEN E=E-1:GOTO 1200'FJVC
```

128 USERS ONLY/AMIGA BEACHBALL

```
1140 X=PEEK(RX)'CFXA
1150 IF X<XM THEN IF X>X0 THEN
     1200'GKDF
1160 IF BT THEN IF ABS(PR+DR*(PL-PR)
     -Y/8+3)>3 THEN 1300'MWEN
1170 MOVSPR 1,A(DR)#D'BKOD
1180 PLAY"A":DR=1-DR:POKE RD,DR
     :E=9'FQCJ
1190 :'ABHD
1200 DY=DY+D/4:Y=Y+DY'FLJB
1210 IF Y>YM THEN Y=YM:DY=-DY
     :PLAY"C"'HNCE
1220 POKE RY,Y'BEXX
1230 GET A$'BCGY
1240 IF BT THEN 1400'CGPB
1250 LOOP WHILE A$=""'DCAD
1260 RUN 800'BDIC
1270 :'ABHC
1300 PLAY"T0O3ABAB"'BBWY
1310 SC(DR)=SC(DR)+1'CNJB
1320 CHAR,9,24,STR$(SC(0))
     :CHAR,27,24,STR$(SC(1))'EDAG
1330 IF SC(DR)>10 THEN
     PLAY"T6O4CDEFGABO5C":MOVSPR 1,0#0
     :SLEEP 4:RUN 800'HXNM
1340 PLAY"O1CDEFGFEDCT3"'BBDE
1350 Y=70:DY=0'CHRE
1360 MOVSPR 1,50+150*DR,Y'DMEG
1370 :'ABHD
1400 IF A$="Q"THEN PL=PL-1
     :IF PL<0 THEN PL=0'JOBG
1410 IF A$="Z"THEN PL=PL+1
     :IF PL>20 THEN PL=20'JQBI
1420 IF A$="P"THEN PR=PR-1
     :IF PR<0 THEN PR=0'JOYI
1430 IF A$="/"THEN PR=PR+1
     :IF PR>20 THEN PR=20'JQHK
1440 CHAR 1,1,PL,P$'BJND
1450 CHAR 1,37,PR,P$'BKVF
1460 LOOP'BAKD
1500 : REM DRAW BALL'BJSB
1510 IF PEEK(789)<>250 THEN
     PRINT"PRESS STOP-RESTORE"
     :STOP'HJJK
1520 GRAPHIC 1,1'BDHB
1530 A=22.5:IF SA THEN CHAR,0,0,
     STR$(SA)+" DEG ROTATION:"'GRAM
1540 :'ABHC
1550 FOR I=1 TO 16: REM GLOBE'EKIH
1560 CIRCLE,CX,CY,W,H,I*A-A,I*A,,
     A'EUBL
1570 IF I<9 THEN R(I)=RDOT(0)-CX
     :X(0,I)=CX-INT(R(I))
     :X(9,I)=RDOT(0):Y(I)=RDOT(1)'NTKX
1580 NEXT'BAEG
1590 Y(0)=RDOT(1)'CHVJ
1600 :'ABHY
1610 FOR I=1 TO 7: REM LATITUDE'EMWF
1620 DRAW, X(0,I),Y(I) TO X(9,I),
     Y(I)'CXBH
1630 NEXT'BAEC
1640 :'ABHD
1650 RF=0:J=1:AA=[PI]/180:RO=SA'GRFM
1660 DO UNTIL RO<A:RO=RO-A:RF=1-RF
     :LOOP'IQEP
1670 :'ABHG
1700 FOR I=RO TO 179 STEP A'EHAE
1710 X=COS(I*AA)'DGSE
1720 FOR K=0 TO 8'DDME
1730 X(J,K)=CX-INT(X*R(K))'EPOJ
1740 NEXT'BAEE
1750 J=J+1'CDHH
1760 NEXT'BAEG
1770 :'ABHH
1800 FOR J=1 TO 8: REM LONGITUDE'ENDG
1810 FOR K=0 TO 7'DDLE
1820 DRAW ,X(J,K),Y(K) TO X(J,K+1),
     Y(K+1)'EADL
1830 NEXT:NEXT'CBLF
1840 :'ABHF
1900 FOR I=2 TO 4: REM PAINT'EJCG
1910 F2=RF+I:Y=(Y(I)+Y(I-1))/2'GTYL
1920 FOR K=0 TO 8'DDMG
1930 IF X(K+1,I)<X(K,I)+2 THEN
     1960'FSLM
1940 X=(X(K,I)+X(K+1,I-1))/2'FSIN
1950 IF (F2+K)AND 1 THEN PAINT,X,Y
     :ELSE PAINT,X,2*CY-Y'JSLR
1960 NEXT:NEXT'CBLJ
1970 :'ABHJ
1980 RETURN'BAQK
1990 :'ABHL
2000 DATA 169,13,162,44,120,141,20,3,
     142,21,3,88,96,173,230,17,41,1,
     240,2,169'BRMH
2010 DATA 255,141,230,17,173,214,17,
     141,216,17,24,105,24,141,218,17,
     141,220,17'BSKI
2020 DATA 144,11,72,169,252,77,230,17,
     141,230,17,104,24,105,24,141,222,
     17,141,224'BVBK
2030 DATA 17,144,11,72,169,240,77,230,
     17,141,230,17,104,24,105,24,141,
     226,17,141'BUKK
2040 DATA 228,17,144,9,169,192,77,230,
     17,141,230,17,24,173,215,17,141,
     219,17,141'BUIM
2050 DATA 223,17,141,227,17,105,42,
     141,217,17,141,221,17,141,225,17,
     141,229,17'BSOM
2060 DATA 165,162,41,7,208,37,172,165,
     44,192,128,16,2,160,175,192,176,
     48,2,160'BSWN
2070 DATA 135,162,7,152,157,248,7,136,
     202,16,248,174,166,44,208,4'BFSM
2080 DATA 24,105,15,168,140,165,44,76,
     101,250,135,0'BQUK
2090 :'ABHD
2100 IF DS>19 THEN PRINT DS$:STOP
     :ELSE RETURN'HJIB
2110 :'ABHV
2200 PRINT"USE STOP/RESTORE TO
     DEFLATE BALL"'BAJF
2210 END'BACW
```

END

BY JERRY STURDIVANT

Keys

for the C128

You can save your redefined function keys.

One of the many good programmer's aids on the 128 is the immediate-mode operation of the function keys. They let you save time by performing many tasks with the pressing of just one key. For instance, when you press the F6 key it will automatically print RUN on the screen and hit RETURN for you.

You can see what each key will do when you first turn on your computer by typing KEY and pressing RETURN. The eight keys and their functions will be displayed on the screen:

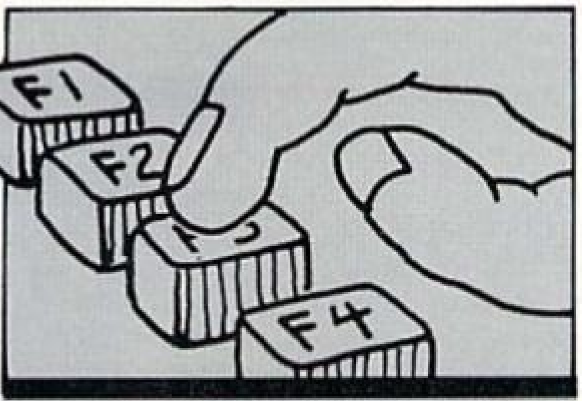
```
KEY 1,“GRAPHIC”
KEY 2,“DLOAD”+CHR$(34)
KEY 3,“DIRECTORY”+CHR$(13)
KEY 4,“SCNCLR”+CHR$(13)
KEY 5,“DSAVE”+CHR$(34)
KEY 6,“RUN”+CHR$(13)
KEY 7,“LIST”+CHR$(13)
KEY 8,“MONITOR”+CHR$(13)
```

Any of these keys can be redefined to handle your favorite operations by typing, for example, KEY 1, entering the action you want taken, then hitting RETURN.

For speed and ease in my personal programming routines, for instance, I changed the F1 key so it will print a clear screen, RUN, and trigger RETURN. That way I can hit F1 at any time without having to find a clear line, and the program or routine I am testing will run.

I changed the F7 key by having it clear the screen, cursor down 25 lines, print LIST and trigger RETURN. Again, I can hit the key on any line and my program will list, starting from the bottom of the screen.

To load the program, press the F3 key for a non-destructive DIRECTORY. Then I run the cursor up the directory to the program I want and hit F5. I changed F5 so it will write DLOAD, then go down one line, over, up, place a colon in front of the PRG label, and hit its own RETURN. One-key program loading and running.



I changed the F7 key by having it clear the screen, print LIST, cursor down 25 lines, and trigger RETURN.

I made the F8 key print LIST, then a long space, then CHR$(13). If I have a range of programs lines I want to list often, I need only add those line numbers in the long space and hit RETURN. F8 is redefined to suit my need at that particular moment.

Save the Keys

Rather than redefining each of the function keys each time you turn on your computer, you can save them on disk. Here is how it is done.

When you have the keys the way you want them, put an empty, formatted disk in the drive and enter the following program line:

```
10 BLOAD“KEY”,B0,P4096
```

Now save this one-line program by typing:

```
DSAVE“KEY BOOT”
```

Once this one-line program is saved, save your keys by entering the following:

```
BSAVE“KEY”,B0,P4096 TO P4347
```

Be sure you use a B, and not a D, on the save. When you hit RETURN, this captures your redefined keys on a disk file.

Now, whenever you sit down and turn on your computer, you insert your “KEYS” disk and hit SHIFT and RUN/STOP. The green light on the disk drive will blink twice, and your personal function keys will be loaded. What happened is that the first program on the disk loaded and ran itself. This was KEY BOOT, which consists of the one-line program we made. It automatically ran itself and loaded the KEY set-up. It's fast and easy. C

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BY KEVIN DEWEY

Connectoids!

for the Commodore 64

In this fast-paced arcade-style game, you are Connecto, king of Connecto-land. As king, it is your duty to travel throughout your kingdom in your connecto-mobile to connect points. This is not an easy task, because the evil green "splat spots" that pop up randomly explode upon contact. You are, of course immortal, but you only have seven connecto-mobiles.

This game has 12 screens, each representing a different area of your domain. On each screen, there are four numbers or dots that you must connect in chronological order. If you connect the dots in any other order, you will explode.

Your connecto-mobile leaves a trail of dots behind it, but only after you've flown over the first point. You can tell when you've hit a dot because it makes a beeping sound as it disappears. It is replaced by a big red circle that looks like your connecto-mobile. That is always the last dot you have to connect, so never fly over dot one and then fly back over it without touching two, three, and four. If you do, you will also explode.

Your connecto-mobile is controlled by the joystick and moves constantly. It always flies in the last direction pressed, except for when you hit the top or bottom of the screen. Then it stops momentarily until you press the joystick in another direction. You can move in a 360-degree radius.

Your connecto-mobile will wrap around on the right and left sides of the screen, but not on the bottom and the top. There are green "splat grids" in the upper-left and lower-right corners of the screen to keep you from flying off. If you run into them, though, you will explode.

The dots your connecto-mobile leaves in its wake are the basis for the scoring in this game. You get 500 points upon the completion of each screen, minus the number of dots you needed to connect the four points. So it is to your advantage to choose the straightest paths between points. If you have to fly over a dot you've already laid down, you get three points subtracted for each dot you lay down on top of one already laid.

The reason this game is difficult is that those nasty "splat spots" I mentioned earlier keep popping up all over the place, forcing you to dodge them and wreck your nice, straight lines. Level 1 is extremely difficult and level 50 is extremely easy. The fun is to be found in the levels in between.

> *As king of Connecto-land, you must connect dots in chronological order and avoid being blown up by those nasty "splat spots."*

The lower levels are the more difficult ones, and you must strive just to survive. But on the higher ones, strive for perfection or the highest score possible. But always avoid running over dots you've already laid. This can really kill a score, but it is safer because "splat spots" never pop up on your dots. You get 1,000 points bonus if you pass screen 13, then you return to screen 1 again.

Good luck!

Before typing this program, read "How to Enter Programs" and "How to Use the Magazine Entry Program." The BASIC programs in this magazine are available on disk from Loadstar, P.O. Box 30007, Shreveport, LA 71130-0007, 1-800-831-2694.

Connectoids!

```
0 H=1:C1=100:C2=1024:C3=2023:Q=35
  :GOTO 101'GFCI
1 P=-40:GOTO 35'DGJC
2 P=40:GOTO 35'CGTC
4 P=-1:GOTO 35'DFJF
5 P=-41:GOTO 35'DGKG
7 P=39:GOTO 35'CGCH
9 P=1:GOTO 35'CFSJ
10 P=-39:GOTO 35'DGRA
12 P=41:GOTO 35'CGUB
15 B=1154:C=1914:D=1174:E=1934
   :GOTO 32'FBCK
16 B=1934:C=1914:D=1154:E=1174
```

```
   :GOTO 32'FBCL
17 B=1534:C=1124:D=1524:E=1924
   :GOTO 32'FBUM
18 B=1064:C=1474:D=1944:E=1459
   :GOTO 32'FBKN
19 B=1084:C=1964:D=1204:E=1804
   :GOTO 32'FBYO
20 B=1304:C=1936:D=1204:E=1944
   :GOTO 32'FBXG
21 B=1389:C=1134:D=1903:E=1105
   :GOTO 32'FBVH
22 B=1124:C=1159:D=1169:E=1983
   :GOTO 32'FBII
23 B=1519:C=1520:D=1559:E=1560
   :GOTO 32'FBCJ
24 B=1521:C=1519:D=1522:E=1520
   :GOTO 32'FBOK
25 B=1982:C=1065:D=1944:E=1102
   :GOTO 32'FBAL
26 B=1124:C=1484:D=1478:E=1970
   :GOTO 32'FBIM
27 B=1144:C=1783:D=1184:E=1863
   :GOTO 32'FBHN
29 PRINT"[CLEAR]":POKE 53281,.
   :POKE 53280,.'DQKM
30 A=1564:L=.:Z=54272:S=56321
   :FOR T=Z TO Z+24'IDTK
31 POKE T,0:NEXT:POKE Z+24,15
   :ON H GOTO 15,16,17,18,19,20,21,22,
   23,24,25,26,27'GBAN
32 POKE B,49:POKE C,50:POKE D,51
   :POKE E,52:POKE B+Z,10:POKE C+Z,14
   :POKE E+Z,4'KLUP
33 POKE D+Z,7:POKE Z+5,C1:POKE Z+6,C1
   :POKE C2,Q:POKE C2,Q:POKE C3+Z,5
   :POKE C3+Z,5'MNQS
34 K=A:POKE A,81:POKE A+Z,8
   :ON NOT PEEK(S)AND 15 GOTO 1,2,2,4,
   5,7,7,9,10,12'JOCQ
35 IF P<-1 AND A<1064 THEN P=.'HJYK
36 IF P>1 AND A>1983 THEN P=.'GJKL
37 A=A+P:IF A<>K AND L>.THEN POKE K,46
   :N=N+1'LQMR
38 IF A<>K AND PEEK(A)<>32 THEN
   59'IJQO
39 IF L=.THEN POKE K,32'EGIL
41 I=I+1'CDFD
42 IF I=G THEN I=.:J=INT(RND(1)*1000)
   +1020:IF PEEK(J)=32 THEN POKE J,42
   :POKE J+Z,5'QJTT
50 GOTO 34'BCOB
59 POKE Z+4,33:POKE Z,100:POKE Z+1,100
   :M=PEEK(A):IF M=46 THEN N=N+3
   :GOTO 67'NIAA
60 IF M=35 THEN 90'DFCF
61 IF M=49 THEN L=L+1:IF L<>1 THEN
   69'JLBL
62 IF M=50 THEN L=L+2:IF L<>3 THEN
   69'JLVM
63 IF M=51 THEN L=L+3:IF L<>6 THEN
   69'JLBN
64 IF M=52 THEN L=L+4:IF L<>10 THEN
   69'JMVO
65 IF M=81 THEN 80'DFCK
66 IF M=42 THEN 69'DFGL
67 POKE Z,.:POKE Z+1,.:IF L=11 THEN
   80'GOWP
68 GOTO 39'BCTK
69 POKE A-39+Z,7:POKE A-41+Z,7
   :POKE A+39+Z,7:POKE A+41+Z,7
   :POKE K,32'NHMB
70 POKE A+Z,7:FOR T=1 TO 20
   :POKE Z+4,129:POKE A,86
   :POKE A-39,78:POKE A-41,77'MKBS
71 POKE A+39,78:POKE A+41,77
   :FOR TT=1 TO 10:NEXT:POKE A,91
   :POKE A+39,32'LHVR
72 POKE A+41,32:POKE A-39,32
   :POKE A-41,32:POKE Z+4,33:NEXT
   :POKE A,32'KHWR
73 Y=Y-1:GOSUB 99:IF Y=.THEN 75'GLMM
74 P=.:N=.:GOTO 30'DIOK
75 POKE Z,0:POKE Z+1,0:PRINT"[CLEAR,
   RIGHT15]GAME OVER."'EJRR
76 PRINT"[CLEAR,DOWN3]FINAL SCORE=";
   SC'BDBO
77 PRINT"HIT F1 TO GIVE IT ANOTHER
   GO..."'BAFS
78 GET A$:IF A$<>"[F1]"THEN 78'FHWQ
79 RUN'BAMM
80 IF M=46 THEN 39'DFHH
81 IF L<>10 THEN 70'EFTI
82 SC=SC+500-N'DIWK
83 PRINT"[HOME]THIS SCREEN=-";500-N;
   " TOTAL=";SC;" MEN=";Y:POKE Z,1
   :POKE Z+1,12'FWJW
84 FOR T=1 TO 15:FOR TT=1 TO 100:NEXT
   :POKE 53280,T+1:NEXT'KWBS
85 IF H=13 THEN PRINT"[DOWN]
   1000 BONUS POINTS.":SC=SC+1000:H=.
   :GOTO 83'ISOW
86 P=.:N=.:H=H+1:GOTO 30'FMVQ
90 POKE K,32:POKE A+Z,7:FOR T=1 TO 20
   :POKE Z+4,129:POKE A,86
   :FOR TT=1 TO 10:NEXT'NIDU
92 POKE A,91:POKE Z+4,33:NEXT
   :POKE A,32'FQDN
93 GOSUB 99:Y=Y-1:IF Y=.THEN 75'GLMO
94 P=.:N=.:GOTO 30'DIOM
99 POKE Z,.:POKE Z+1,.:PRINT"[HOME]
   MEN=";Y;" SCORE=";SC:FOR T=1 TO 999
   :NEXT:RETURN'JXUC
101 POKE 53281,.:POKE 53280,.
    :PRINT"[CLEAR,WHITE,RIGHT15]
    CONNECTOIDS!"'DQOG
102 PRINT"[RIGHT14,DOWN3]
    BY KEVIN DEWEY."'BAOD
104 PRINT"[DOWN2]SKILL LEVEL"
    :PRINT"1-HARDEST[DOWN,LEFT9]
    50-EASIEST [UP2]";:INPUT G'DENQ
105 IF G<1 OR G>50 THEN PRINT"PLEASE
    KEEP IT BETWEEN 1 AND 50."
    :GOTO 103'HJFO
106 Y=7:GOTO 29'CFLD
```

END

BY BRUCE JAEGER

Jiffy Jotter

for the Commodore 64 and 128

Jiffy Jotter is a fast-loading no-frills notebook program that does away with those quickly jotted down notes on the scraps of paper that you never fail to lose.

We've all seen notebook programs before, either magazine, user group or commercial. They all seem to have two fatal flaws: They take too long to load and are too cumbersome. To jot down a simple note, you certainly don't want to have to take five minutes to load your notepad program and then create a database file structure.

Jiffy Jotter will load and run faster than you can find your pencil and paper—less than nine seconds on the Commodore 64 with 1541 disk drive and under two seconds on the Commodore 128 with 1571 drive! Once running, Jiffy Jotter will list its five commands on the screen, as well as a numbered list of the notebook subject already on disk. Here's how to use some of the commands.

Type A followed by the number (zero through nine) of a listed subject to add to that subject. Jiffy Jotter doesn't use BASIC's standard INPUT statement, so your note can include quotation marks, commas and colons.

Type R followed by the subject number to read the notes you've already written. Jiffy Jotter uses a machine-language routine to read the notes from disk and write them on the screen. Push shift or shift-lock to pause.

Type C to create a new notebook subject. You will then be asked for the category name, which will also be the disk file name. Then Jiffy Jotter creates a sequential file with that subject name on the disk, and returns you to the main menu.

Type D to delete a subject and Q to quit the program.

All the disk activity (writing, updating files) in Jiffy Jotter takes place immediately, so you never have to worry about accidently pressing the stop key and losing your notes. And no disk file, other than the very short list of subjects, is ever loaded into memory, which is where Jiffy Jotter saves a lot of time. All your notes are stored in standard sequential files, easily read by almost every word processing program. (I used Jiffy Jotter to write most of a short humor book, and then my word processor just to rearrange things.)

Jiffy Jotter can tell whether or not it's running on a Commodore 64 or a 128 by comparing FRE(0) to FRE(1). On a 64, the two results will always be the same. On the 128, the amount of memory free in banks zero and one will always be different at the start of the program. On the 128, Jiffy Jotter peeks at location 215, so the display is in 80-column mode.

The machine-language reader also checks to see if it's running on a 64 or 128. As you look at the source code, notice that there are no JMP commands, so that the code is relocatable. In the 64 version, the machine code is poked into the cassette buffer, starting at 828. For the 128, the cassette buffer is located at 2816.

Why is a machine-language disk reader necessary? All commas and colons contained in the notes would cause the standard INPUT# to ignore everything after a comma or colon. And the quotation marks might set the editor into the quote mode. So the characters need to be read from the disk one at a time, and the quote mode flag is reset to zero after each character is printed. Done in BASIC, the letters just kind of s-l-o-w-l-y c-h-u-g across the screen; this was just the kind of job for a simple machine-language program.

Do away with those quickly jotted down notes on the scraps of paper you never fail to lose.

Before typing these programs, read "How to Enter Programs," and "How to Use the Magazine Entry Program." The BASIC programs in this magazine are available on disk from Loadstar, P.O. Box 30007, Shreveport, LA 71130-0007, 1-800-831-2694.

Jiffy Jotter

```
10 GOTO 230:REM SKIP SUBROUTINES'CTDD
20 OPEN 15,8,15,"S0:JOTTER"
   :SAVE"JOTTER",8:END'DMRG
30 REM INPUT ROUTINE'BMSD
40 IN$="":PRINT Y$;'CHWC
50 IF(PEEK(162)AND 16)=16 THEN PRINT
   U$;L$;'GRKI
60 IF(PEEK(162)AND 16)=0 THEN PRINT"
   ";L$;'GOWI
70 GET Z$:IF Z$=""THEN 50'EHGH
80 IF Z$=CHR$(13)THEN RETURN'FGHI
90 IF Z$<>D$THEN 130'EHQJ
100 IF LEN(IN$)=0 THEN 70'EIXY
110 IN$=LEFT$(IN$,LEN(IN$)-1)'EPYC
120 PRINT" "L$L$;:GOTO 50'CIBY
130 IF LEN(IN$)>239 THEN 50'EKFC
140 IN$=IN$+Z$:PRINT Z$;:POKE QM,0
    :GOTO 50'FUGG
150 REM ERROR ROUTINE'BMME
160 INPUT#15,E,E$'BHOC
170 IF E THEN PRINT E$ : STOP'EEQF
180 RETURN'BAQD
190 REM GET IN$ SUBROUTINE'BQHJ
200 GET IN$:IF IN$=""THEN 200'EKXA
210 RETURN'BAQW
220 REM INITIATE'BIEA
230 PRINT CHR$(147)CHR$(14)'DJBC
240 POKE 53280,0:POKE 53281,0
    :DIM A$(15)'DWBG
250 SF$="0:SUBJECT.FILE"'BDSG
260 OPEN 15,8,15:OPEN 2,8,2,SF$'CRBG
270 INPUT#15,E:IF E=62 THEN X=10:NF=0
    :GOTO 290'HTIL
280 INPUT#2,NF:X=NF+10:IF X<10 THEN
    X=10'HRFM
290 IF E=62 THEN 310'DGLI
300 FOR X=1 TO NF:INPUT#2,A$(X)
    :NEXT'FNRC
310 CLOSE 2'BBJX
320 D$=CHR$(20):Y$=CHR$(158)'EODE
330 W$=CHR$(5):B$=CHR$(154)
    :P$=CHR$(156)'GVUI
340 U$=CHR$(164):L$=CHR$(157)'EPNG
350 W=40'BDID
360 C=64:IF FRE(0)<>FRE(1)THEN
    C=128'IOYL
370 IF C=64 THEN QM=212:SM=828'FONK
380 IF C=128 THEN QM=244:NK=88
    :SM=2816'GVDN
390 IF C=128 AND PEEK(215)=128 THEN
    W=80'HPRN
400 GOSUB 980:REM POKE IN ML'CMKC
410 PRINT"[CLEAR,WHITE,RVS,SHFT J]
    IFFY [SHFT J]OTTER"'BAPE
420 PRINT"[CYAN,SHFT C]OMMANDS:"'BACE
430 PRINT W$ " [SHFT A,SPACE5]";P$;"
    [SHFT A]DD NOTE TO A FILE"'BGTJ
440 PRINT W$ " [SHFT R,SPACE5]";P$;"
    [SHFT R]EAD A FILE"'BGOI
450 PRINT W$ " [SHFT C,SPACE5]";P$;"
    [SHFT C]REATE NEW FILE"'BGNL
460 PRINT W$ " [SHFT D,SPACE5]";P$;"
    [SHFT D]ELETE FILE"'BGAL
470 PRINT: PRINT CHR$(150);" [SHFT Q,
    SPACE5]";P$;"[SHFT Q,SHFT U,
    SHFT I,SHFT T]"'DLYO
480 PRINT'BACG
490 PRINT"[CYAN,SHFT F]ILES ON
    [SHFT D]ISK:"'BAYM
500 FOR X=1 TO NF:PRINT W$;X-1;TAB(7);
    B$;A$(X):NEXT'HXXI
510 PRINT:PRINT"[YELLOW,SHFT C]
    OMMAND?":GOSUB 200'DFQG
520 IF IN$="C"THEN 720'DGXE
530 IF IN$="D"THEN 860'DGEF
540 IF IN$="Q"THEN 750'DGPG
550 CD$=IN$'BGYG
560 A$="[SHFT A]DD TO":IF IN$="R"THEN
    A$="[SHFT R]EAD"'FILO
570 PRINT:PRINT A$;" WHICH
    SUBJECT?"'CEBM
580 GOSUB 200'BDFI
590 A=VAL(IN$)+1:IF A<1 OR A>NF THEN
    410'IQAQ
600 F$="0:"+A$(A)'CHPD
610 IF LEN(F$)>20 THEN F$=LEFT$(F$,
    20)'GPOH
620 IF CD$="R"THEN 1050'DHRF
630 MX=6:IF W=80 THEN MX=3'FKSI
640 PRINT"[CLEAR,WHITE,SHFT E]
    NTER TEXT:[SPACE2]("MX"LINES MAX
    )"'BCKM
650 PRINT:PRINT Y$:GOSUB 40'DGUI
660 GOSUB 690:PRINT#2,IN$
    :GOSUB 160'DNQK
670 PRINT#2:CLOSE 2'CDNI
680 GOTO 410'BDEJ
690 REM OPEN SEQUENTIAL FOR
    APPEND'BXPQ
700 CLOSE 2:OPEN 2,8,2,F$+",A,S,
    W"'DKIG
710 RETURN'BAQC
720 PRINT"[CLEAR,WHITE,SHFT N]
    EW CATEGORY NAME: ";:GOSUB 40'CERL
730 A$(NF+1)=IN$:NF=NF+1'EQDK
740 PRINT"[CLEAR]":GOSUB 810
    :GOTO 1150'DJXJ
750 REM QUIT'BEJH
760 PRINT:PRINT"[RVS,L. RED,SHFT A]
    RE YOU SURE?"'CBAN
770 GOSUB 200:IF IN$="[SHFT Y]
    "THEN IN$="Y"'FKCO
780 IF IN$<>"Y"THEN 410'EGNN
790 PRINT"[CLEAR,WHITE]":END'CBKL
800 REM CREATE FILE'BKXF
810 F$="0:"+IN$'CFLF
820 IF LEN(F$)>20 THEN F$=LEFT$(F$,
    20)'GPOK
830 CLOSE 2:OPEN 2,8,2,F$+",S,W"
    :CLOSE 2'EMPK
840 GOSUB 160'BDKH
```

```
850 RETURN'BAQH
860 REM DELETE A FILE'BLML
870 PRINT"[CLEAR,PURPLE,RVS,SHFT D]
    ELETE":PRINT'CBGN
880 FOR X=1 TO NF:PRINT W$;X-1;TAB(7);
    B$;A$(X):NEXT'HXXT
890 PRINT:PRINT'CBHM
900 INPUT"[YELLOW,SHFT D]ELETE
    [SHFT F]ILE #[SPACE3]";IN$'BELJ
910 A=VAL(IN$)+1:IF A<1 OR A>NF THEN
    410'IQAM
920 PRINT:PRINT:PRINT"[WHITE,SHFT D]
    ELETE "A$(A)"."'DHTK
930 PRINT:PRINT"[L. BLUE,SHFT A]
    RE YOU [SHFT S,SHFT U,SHFT R,
    SHFT E]?":GOSUB 200'DFAP
940 IF IN$<>"Y"THEN 410'EGNL
950 PRINT:PRINT"[L. RED,SHFT D]
    ELETING..."'CBYN
960 PRINT#15,"S0:"+A$(A)+"*"'DIUN
970 A$(A)="":NF=NF-1:GOTO 1150'EQJQ
980 REM ML DISK READER'BMGP
990 FOR J=SM TO SM+65:READ A:POKE J,A
    :NEXT:RETURN'IPGU
1000 DATA 173,214,240,201,82,240,27,
     162,2,32,198,255,32,228,255,
     32'BGYE
1010 DATA 210,255,169,0,133,244,165,
     211,201,0,208,250,166,144,208,
     30'BIHF
1020 DATA 240,234,162,2,32,198,255,32,
     228,255,32,210,255,169,0,133'BGAG
1030 DATA 212,173,141,2,201,0,208,249,
     166,144,208,2,240,233,32,204'BGDH
1040 DATA 255,96'BGKX
1050 REM DISK READER'BKIB
1060 CLOSE 2:OPEN 2,8,2,F$
     :GOSUB 150'DOUD
1070 PRINT"[CLEAR,WHITE,SHFT P]RESS
     [SHFT S,SHFT H,SHFT I,SHFT F,
     SHFT T] [SHFT K,SHFT E,SHFT Y]
      TO PAUSE."'BAMM
1080 PRINT:PRINT"[SHFT P]
     RESS ANY KEY TO BEGIN."'CBTJ
1090 GOSUB 200'BDFD
1100 PRINT:PRINT Y$'CDHU
1110 SYS SM : CLOSE 2'CEXW
1120 PRINT:PRINT W$"[SHFT P]
     RESS ANY KEY."'CDMC
1130 GOSUB 200:GOTO 410'CHSY
1140 REM ERASE/REWRITE
     SUBJECT.FILE'BAXF
1150 PRINT:PRINT"[YELLOW,SHFT U]
     PDATING SUBJECT FILE..."'CBVH
1160 PRINT#15,"S"+SF$'CGDC
1170 OPEN 2,8,2,SF$+",S,W"
     :PRINT#2,NF'DOOG
1180 FOR X=1 TO NF+1'EFGF
1190 IF A$(X)<>""THEN PRINT#2,
     A$(X)'FMRI
1200 NEXT:CLOSE 2:RUN'DDGW
```

END

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Although there are almost 1000 known Commodore user groups nationwide and around the world, this list includes only those that have been officially recognized by Commodore as Approved User Groups. If your group would like to apply for Approved status, contact Pete Baczor, User Group Coordinator, at Commodore Business Machines, 1200 Wilson Drive, West Chester, PA 19380.

Commodore user groups provide invaluable assistance to Commodore computerists. If you are looking for people who share your computing interests, or if you need help getting started with your computer, contact the group near you.

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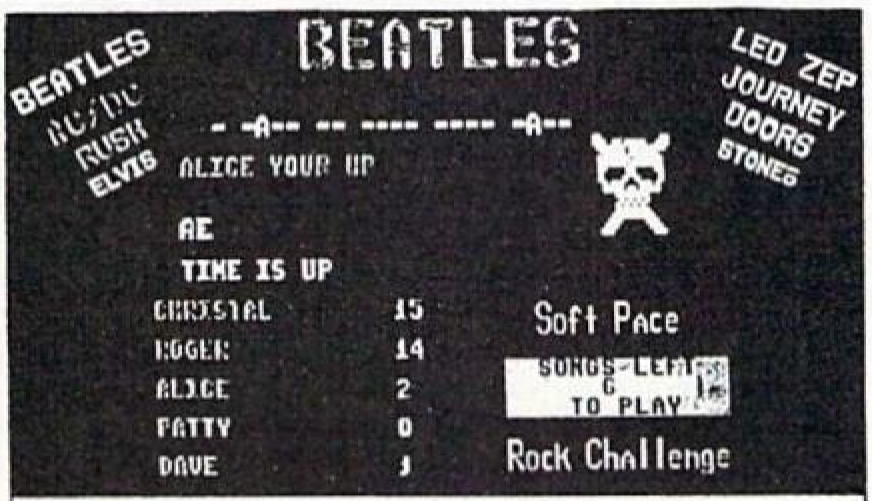

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HOW TO ENTER PROGRAMS

The programs which appear in this magazine have been run, tested and checked for bugs and errors. After a program is tested, it is printed on a letter quality printer with some formatting changes. This listing is then photographed directly and printed in the magazine. Using this method ensures the most error-free program listings possible.

Whenever you see a word inside brackets, such as [DOWN], the word represents a keystroke or series of keystrokes on the keyboard. The word [DOWN] would be entered by pressing the cursor-down key. If multiple keystrokes are required, the number will directly follow the word. For example, [DOWN4] would mean to press the cursor-down key four times. If there are multiple words within one set of brackets, enter the keystrokes directly after one another. For example, [DOWN,RIGHT2] would mean to press the cursor-down key once and then the cursor-right key twice. Note: Do not enter the commas.

In addition to these graphic symbols, the keyboard graphics are all represented by a word and a letter. The word is either SHFT or CMD and represents the SHIFT key or the Commodore key. The letter is one of the letters on the keyboard. The combination [SHIFT E] would be entered by holding down the SHIFT key and pressing the E. A number following the letter tells you how many times to type the letter. For example, [SHFT A4,CMD B3] would mean to hold the SHIFT key and press the A four times, then hold down the Commodore key and press the B three times.

The following chart tells you the keys to press for any word or words inside of brackets. Refer to this chart whenever you aren't sure what keys to press. The little graphic next to the keystrokes shows you what you will see on the screen.

Syntax Error

This is by far the most common error encountered while entering a program. Usually (sorry folks) this means that you have typed something incorrectly on the line the syntax error refers to. If you get the message "?Syntax Error Break In Line 270," type LIST 270 and press RETURN. This will list line 270 to the screen. Look for any non-obvious mistakes like a zero in place of an O or vice-versa. Check for semicolons and colons reversed and extra or missing parentheses. All of these things will cause a syntax error.

There is only one time a syntax error will tell you the wrong line to look at. If the line the syntax error refers to has a function call (e.g., FN A(3)), the syntax error may be in the line that defines the function, rather than the line named in the error message. Look for a line near the beginning of the program (usually) that has DEF FN A(X) in it with an equation following it. Look for a typo in the equation part of this definition.

Illegal Quantity Error

This is another common error message. This can also be caused by a typing error, but it is a little harder to find. Once again, list the line number that the error message refers to. There is probably a poke statement on this line. If there is, then the error is referring to what is trying to be poked. A number must be in the range of zero to 255 to be poke-able. For example, the statement POKE 1024,260 would produce an illegal quantity error because 260 is greater than 255.

Most often, the value being poked is a variable (A,X...). This error is telling you that this variable is out of range. If the variable is being read from data statements, then the problem is somewhere in the data statements. Check the data statements for missing commas or other typos.

If the variable is not coming from data statements, then the problem will be a little harder to find. Check each line that contains the variable for typing mistakes.

Out Of Data Error

This error message is always related to the data statements in a program. If this error occurs, it means that the program has run out of data items before it was supposed to. It is usually caused by a problem or typo in the data statements. Check first to see if you have left out a whole line of data. Next, check for missing commas between numbers. Reading data from a page of a magazine can be a strain on the brain, so use a ruler or a piece of paper or anything else to help you keep track of where you are as you enter the data.

Other Problems

It is important to remember that the 64 and the PET/CBM computers will only accept a line up to 80 characters long. The VIC 20 will accept a line up to 88 characters long and the 128 a line up to 160 characters long. Sometimes you will find a line in a program that runs over this number of characters. This is not a mistake in the listing. Sometimes programmers get so carried away crunching programs that they use abbreviated commands to get more than the standard number of characters on one line.

"[HOME]" = UNSHIFTED CLR/ HOME
"[CLEAR]" = SHIFTED CLR/HOME
"[DOWN]" = CURSOR DOWN
"[UP]" = CURSOR UP
"[RIGHT]" = CURSOR RIGHT
"[LEFT]" = CURSOR LEFT
"[RVS]" = CONTROL 9
"[RVOFF]" = CONTROL 0
"[BLACK]" = CONTROL 1
"[WHITE]" = CONTROL 2
"[RED]" = CONTROL 3
"[CYAN]" = CONTROL 4
"[PURPLE]" = CONTROL 5
"[GREEN]" = CONTROL 6
"[BLUE]" = CONTROL 7
"[YELLOW]" = CONTROL 8
"[ORANGE]" = COMMODORE 1
"[BROWN]" = COMMODORE 2
"[L. RED]" = COMMODORE 3
"[GRAY1]" = COMMODORE 4
"[GRAY2]" = COMMODORE 5
"[L. GREEN]" = COMMODORE 6
"[L. BLUE]" = COMMODORE 7
"[GRAY3]" = COMMODORE 8
"[F1]" = F1
"[F2]" = F2
"[F3]" = F3
"[F4]" = F4
"[F5]" = F5
"[F6]" = F6
"[F7]" = F7
"[F8]" = F8
"[POUND]" = ENGLISH POUND
"[SHFT ^]" = PI SYMBOL
"[^]" = UP ARROW

GRAPHIC SYMBOLS WILL BE REPRESENTED AS EITHER THE LETTERS SHFT (SHIFT) AND A KEY ("[SHFT Q,SHFT J,SHFT D,SHFT S]") OR THE LETTERS CMDR (COMMODORE) AND A KEY ("[CMDR Q,CMDR G,COMDR Y,CMDR H]"). IF A SYMBOL IS REPEATED, THE NUMBER OF REPITITIONS WILL BE DIRECTLY AFTER THE KEY AND BEFORE THE COMMA ("[SPACE3,SHFT S4,CMDR M2]").

HOW TO ENTER PROGRAMS

You can enter these lines by abbreviating the commands when you enter the line. The abbreviations for BASIC commands are in your user guide.

If you type a line that is longer than the acceptable number of characters, the computer will act as if everything is ok, until you press RETURN. Then, a syntax error will be displayed (without a line number). Many people write that the computer gives them a syntax error when they type the line, or that the computer refuses to accept a line. Both of these problems are results of typing a line that has too many characters.

The Program Won't Run!!

This is the hardest of problems to resolve; no error message is displayed, but the program just doesn't run. This can be caused by many small mistakes typing a program in. First check that the program was written for the computer you are using. Check to see if you have left out any lines of the program. Check each line of the program for typos or missing parts. Finally, press the RUN/STOP key while the program is "running." Write down the line the program broke at and try to follow the program backwards from this point, looking for problems.

If All Else Fails

You've come to the end of your rope. You can't get the program to run and you can't find any errors in your typing. What do you do? As always, we suggest that you try a local user group for help. In a group of even just a dozen members, someone is bound to have typed in the same program. The user group may also have the program on a library disk and be willing to make a copy for you. For $9.95 per issue, you can also get all the BASIC programs in each issue, as well, from Loadstar, P.O. Box 30007, Shreveport, LA 71130-0007.

If you do get a working copy, be sure to compare it to your own version so that you can learn from your errors and increase your understanding of programming.

If you live in the country, don't have a local user group, or you simply can't get any help, write to us. If you do write to us, include the following information about the program you are having problems with:

The name of the program
The issue of the magazine it was in
The computer you are using
Any error messages and the line numbers
Anything displayed on the screen
A printout of your listing (if possible)

All of this information is helpful in answering your questions about why a program doesn't work. A letter that simply states "I get an error in line 250 whenever I run the program" doesn't give us much to go on. Send your questions to:

Commodore Magazines
1200 Wilson Drive
West Chester, PA 19380
ATTN: Program Problem

HOW TO USE THE MAGAZINE ENTRY PROGRAMS

The Magazine Entry Programs on the next pages are two BASIC machine language programs that will assist you in entering the programs in this magazine correctly. There are versions for both the Commodore 64 and the Commodore 128. Once the program is in place, it works its magic without you having to do anything else. The program will not let you enter a line if there is a typing mistake on it, and better yet, it identifies the kind of error for you.

Getting Started

Type in the Magazine Entry Program carefully and save it as you go along (just in case). Once the whole program is typed in, save it again on tape or disk. Now RUN the program. The word POKING will appear on the top of the screen with a number. The number will increment from 49152 up to 49900 (4864-5545 on the 128) and just lets you know that the program is running. If everything is ok, the program will finish running and say DONE. Then type NEW. If there is a problem with the data statements, the program will tell you where to find the problem. Otherwise the program will say "mistake in data statements." Check to see if commas are missing, or if you have used periods instead of commas. Also check the individual data items.

Once the program has run, it is in memory ready to go. To activate the program type SYS49152 (SYS4864 on the 128), and press RETURN. You are now ready to enter the programs from the magazine. To disable the Entry Program, just type KILL (RETURN) on the 64 or SYS4867 on the 128.

The checksums for each line are the same for both the 64 and 128, so you can enter your 64 programs on the 128 if you'd like.

Typing the Programs

All the BASIC program listings in this magazine that are for the 64 or 128 have an apostrophe followed by four letters at the end of the line (e.g., 'ACDF). If you plan to use the Magazine Entry Program to enter your programs, the apostrophe and letters **should** be entered along with the rest of the line. This is a checksum that the Magazine Entry Program uses.

Enter the line and the letters at the end and then press RETURN, just as you normally would.

If the line is entered correctly, a bell is sounded and the line is entered into the computer's memory (without the characters at the end).

If a mistake was made while entering the line, a noise is sounded and an error message is displayed. Read the error message, then press any key to erase the message and correct the line.

IMPORTANT

If the Magazine Entry Program sees a mistake on a line, it **does not** enter that line into memory. This makes it impossible to enter a line incorrectly.

Error Messages and What They Mean

There are five error messages that the Magazine Entry Program uses. Here they are, along with what they mean and how to fix them.

Continued next page

HOW TO USE THE MAGAZINE ENTRY PROGRAMS

NO CHECKSUM: This means that you forgot to enter the apostrophe and the four letters at the end of the line. Move the cursor to the end of the line you just typed and enter the checksum.

QUOTE: This means that you forgot (or added) a quote mark somewhere in the line. Check the line in the magazine and correct the quote.

KEYWORD: This means that you have either forgotten a command or spelled one of the BASIC keywords (GOTO, PRINT . .) incorrectly. Check the line in the magazine again and check your spelling.

# OF CHARACTERS: This means that you have either entered extra characters or missed some characters. Check the line in the magazine again. This error message will also occur if you misspell a BASIC command, but create another keyword in doing so. For example, if you misspell PRINT as PRONT, the 64 sees the letter P and R, the BASIC keyword ON and then the letter T. Because it sees the keyword ON, it thinks you've got too many characters, instead of a simple misspelling. Check spelling of BASIC commands if you can't find anything else wrong.

UNIDENTIFIED: This means that you have either made a simple spelling error, you typed the wrong line number, or you typed the checksum incorrectly. Spelling errors could be the wrong number of spaces inside quotes, a variable spelled wrong, or a word misspelled. Check the line in the magazine again and correct the mistake. ■

MAGAZINE ENTRY PROGRAM—64

The Magazine Entry Programs are available on disk, along with the other programs in this magazine, for $9.95. To order, contact Loadstar at 1-800-831-2694.

```
10 PRINT"[CLEAR]POKING -";
20 P=49152 :REM $C000   (END AT
   49900/$C2EC)
30 READ A$:IF A$="END"THEN 110
40 L=ASC(MID$(A$,2,1))
50 H=ASC(MID$(A$,1,1))
60 L=L-48:IF L>9 THEN L=L-7
70 H=H-48:IF H>9 THEN H=H-7
80 PRINT"[HOME,RIGHT12]"P;
90 IF H>15 OR L>15 THEN PRINT
   :PRINT"DATA ERROR IN LINE";
   1000+INT((P-49152)/8):STOP
100 B=H*16+L:POKE P,B:T=T+B:P=P+1
    :GOTO 30
110 IF T<>86200 THEN PRINT
    :PRINT"MISTAKE IN DATA --> CHECK
    DATA STATEMENTS":END
120 PRINT"DONE":END
1000 DATA 4C,1F,C0,00,00,00,00,00
1001 DATA 00,00,00,00,00,0D,00,21
1002 DATA C1,27,C1,2F,C1,3F,C1,4C
1003 DATA C1,EA,EA,EA,4C,54,C0,A2
1004 DATA 05,BD,19,C0,95,73,CA,10
1005 DATA F8,60,60,A0,03,B9,00,02
1006 DATA D9,04,C1,D0,F5,88,10,F5
1007 DATA A0,05,B9,A2,E3,99,73,00
1008 DATA 88,10,F7,A9,00,8D,18,D4
1009 DATA 4C,EF,C0,E6,7A,D0,02,E6
1010 DATA 7B,4C,79,00,A5,9D,F0,F3
1011 DATA A5,7A,C9,FF,D0,ED,A5,7B
1012 DATA C9,01,D0,E7,20,2B,C0,AD
1013 DATA 00,02,20,74,C0,90,DC,A0
1014 DATA 00,4C,A9,C1,C9,30,30,06
1015 DATA C9,3A,10,02,38,60,18,60
1016 DATA C8,B1,7A,C9,20,D0,03,C8
1017 DATA D0,F7,B1,7A,60,18,C8,B1
1018 DATA 7A,F0,37,C9,22,F0,F5,6D
1019 DATA 03,C0,8D,03,C0,AD,04,C0
1020 DATA 69,00,8D,04,C0,4C,8E,C0
1021 DATA 18,6D,05,C0,8D,05,C0,90
1022 DATA 03,EE,06,C0,EE,09,C0,4C
1023 DATA CE,C1,18,6D,08,C0,8D,08
1024 DATA C0,90,03,EE,07,C0,EE,0A
1025 DATA C0,60,0A,A8,B9,0F,C0,85
1026 DATA FB,B9,10,C0,85,FC,A0,00
1027 DATA A9,12,20,D2,FF,B1,FB,F0
1028 DATA 06,20,D2,FF,C8,D0,F6,20
1029 DATA BC,C2,20,E4,FF,F0,FB,A0
1030 DATA 18,B9,08,C1,20,D2,FF,88
1031 DATA 10,F7,68,68,A9,00,8D,00
1032 DATA 02,4C,74,A4,4B,49,4C,4C
1033 DATA 91,91,0D,20,20,20,20,20
1034 DATA 20,20,20,20,20,20,20,20
1035 DATA 20,20,20,20,20,20,20,91
1036 DATA 0D,51,55,4F,54,45,00,4B
1037 DATA 45,59,57,4F,52,44,00,23
1038 DATA 20,4F,46,20,43,48,41,52
1039 DATA 41,43,54,45,52,53,00,55
1040 DATA 4E,49,44,45,4E,54,49,46
1041 DATA 49,45,44,00,4E,4F,20,43
1042 DATA 48,45,43,4B,53,55,4D,00
1043 DATA C8,B1,7A,D0,FB,84,FD,C0
1044 DATA 09,10,03,4C,84,C1,88,88
1045 DATA 88,88,88,B1,7A,C9,27,D0
1046 DATA 13,A9,00,91,7A,C8,A2,00
1047 DATA B1,7A,9D,3C,03,C8,E8,E0
1048 DATA 04,D0,F5,60,A9,04,4C,CA
1049 DATA C0,A0,00,B9,00,02,99,40
1050 DATA 03,F0,F0,C8,D0,F5,A0,00
1051 DATA B9,40,03,F0,E6,99,00,02
1052 DATA C8,D0,F5,20,96,C1,4C,12
1053 DATA C2,A0,09,A9,00,99,03,C0
1054 DATA 8D,3C,03,88,10,F7,A9,80
1055 DATA 85,02,A0,00,20,58,C1,20
1056 DATA 89,C1,20,ED,C1,E6,7A,E6
1057 DATA 7B,20,7C,A5,A0,00,20,80
1058 DATA C0,F0,D0,24,02,F0,06,4C
1059 DATA A8,C0,4C,CE,C1,C9,22,D0
1060 DATA 06,20,8D,C0,4C,CE,C1,20
1061 DATA BA,C0,4C,CE,C1,A0,00,B9
1062 DATA 00,02,20,74,C0,C8,90,0A
1063 DATA 18,6D,07,C0,8D,07,C0,4C
1064 DATA EF,C1,88,A2,00,B9,00,02
1065 DATA 9D,00,02,F0,04,E8,C8,D0
1066 DATA F4,60,18,AD,09,C0,69,41
1067 DATA 8D,09,C0,38,AD,0A,C0,E9
1068 DATA 19,90,06,8D,0A,C0,4C,1C
1069 DATA C2,AD,0A,C0,69,41,8D,0A
```

```
1070 DATA C0,AD,03,C0,6D,05,C0,48
1071 DATA AD,04,C0,6D,06,C0,8D,0C
1072 DATA C0,68,6D,08,C0,8D,0B,C0
1073 DATA AD,0C,C0,6D,07,C0,8D,0C
1074 DATA C0,38,E9,19,90,06,8D,0C
1075 DATA C0,4C,52,C2,AD,0C,C0,69
1076 DATA 41,8D,0C,C0,AD,0B,C0,E9
1077 DATA 19,90,06,8D,0B,C0,4C,67
1078 DATA C2,AD,0B,C0,69,41,8D,0B
1079 DATA C0,A0,01,AD,09,C0,CD,3C
1080 DATA 03,D0,20,C8,AD,0A,C0,CD
1081 DATA 3D,03,D0,17,C8,AD,0B,C0
1082 DATA CD,3E,03,D0,0E,AD,0C,C0
1083 DATA CD,3F,03,D0,06,20,CC,C2
1084 DATA 4C,4B,C0,98,48,68,4C,CA
1085 DATA C0,A9,20,8D,00,D4,8D,01
1086 DATA D4,A9,09,8D,05,D4,A9,0F
1087 DATA 8D,18,D4,60,20,A9,C2,A9
1088 DATA 81,20,DF,C2,A9,80,20,DF
1089 DATA C2,4C,D9,C2,20,A9,C2,A9
1090 DATA 11,20,DF,C2,A9,10,20,DF
1091 DATA C2,A9,00,8D,04,D4,60,8D
1092 DATA 04,D4,A2,70,A0,00,88,D0
1093 DATA FD,CA,D0,FA,60,END
```

END

MAGAZINE ENTRY PROGRAM–128

```
5 TRAP 200
10 PRINT"[CLEAR]POKING -";
20 P=4864 :REM $1300  (END AT
   5545/$15A9)
30 READ A$:IF A$="END"THEN 110
80 PRINT"[HOME,RIGHT12]"P;
100 B=DEC(A$):POKE P,B:T=T+B:P=P+1
    :GOTO 30
110 IF T<>59314 THEN PRINT
    :PRINT"MISTAKE IN DATA --> CHECK
    DATA STATEMENTS":END
120 PRINT"DONE":END
200 PRINT:PRINT"DATA ERROR IN LINE";
    1000+INT((P-4864)/8):END
1000 DATA 4C,1E,13,4C,3A,13,00,00
1001 DATA 8E,00,F7,00,42,41,51,57
1002 DATA 0D,00,0D,43,08,14,0E,14
1003 DATA 16,14,26,14,33,14,A9,00
1004 DATA 8D,00,FF,AD,04,03,8D,12
1005 DATA 13,AD,05,03,8D,13,13,A2
1006 DATA 4A,A0,13,8E,04,03,8C,05
1007 DATA 03,60,AD,12,13,8D,04,03
1008 DATA AD,13,13,8D,05,03,60,6C
1009 DATA 12,13,A5,7F,D0,F9,AD,00
1010 DATA 02,20,5B,13,90,F1,A0,00
1011 DATA 4C,6F,14,C9,30,30,06,C9
1012 DATA 3A,10,02,38,60,18,60,C8
1013 DATA B1,3D,C9,20,D0,03,C8,D0
1014 DATA F7,B1,3D,60,18,C8,B1,3D
1015 DATA F0,35,C9,22,F0,F5,6D,06
1016 DATA 13,8D,06,13,AD,07,13,69
1017 DATA 00,8D,07,13,4C,75,13,18
1018 DATA 6D,08,13,8D,08,13,90,03
1019 DATA EE,09,13,EE,0C,13,60,18
1020 DATA 6D,0B,13,8D,0B,13,90,03
1021 DATA EE,0A,13,EE,0D,13,60,0A
1022 DATA A8,B9,14,13,85,FB,B9,15
1023 DATA 13,85,FC,A0,00,8C,00,FF
1024 DATA A9,12,20,D2,FF,B1,FB,F0
1025 DATA 06,20,D2,FF,C8,D0,F6,20
1026 DATA 79,15,20,A3,15,20,E4,FF
1027 DATA F0,FB,A0,1B,B9,EF,13,20
1028 DATA D2,FF,88,10,F7,68,68,A9
1029 DATA 00,8D,00,02,4C,B7,4D,91
1030 DATA 91,0D,20,20,20,20,20,20
1031 DATA 20,20,20,20,20,20,20,20
1032 DATA 20,20,20,20,20,20,91,0D
1033 DATA 51,55,4F,54,45,00,4B,45
1034 DATA 59,57,4F,52,44,00,23,20
1035 DATA 4F,46,20,43,48,41,52,41
1036 DATA 43,54,45,52,53,00,55,4E
1037 DATA 49,44,45,4E,54,49,46,49
1038 DATA 45,44,00,4E,4F,20,43,48
1039 DATA 45,43,4B,53,55,4D,00,C8
1040 DATA B1,3D,D0,FB,C0,09,10,03
1041 DATA 4C,69,14,88,88,88,88,88
1042 DATA B1,3D,C9,27,D0,13,A9,00
1043 DATA 91,3D,C8,A2,00,B1,3D,9D
1044 DATA 00,0B,C8,E8,E0,04,D0,F5
1045 DATA 60,4C,5C,15,4C,C5,14,A0
1046 DATA 09,A9,00,99,06,13,8D,00
1047 DATA 0B,88,10,F7,A9,80,85,FD
1048 DATA A0,00,20,3F,14,20,AE,14
1049 DATA 20,0D,43,84,FA,A0,FF,20
1050 DATA 67,13,F0,D8,24,FD,F0,06
1051 DATA 20,8F,13,4C,8F,14,C9,22
1052 DATA D0,06,20,74,13,4C,8F,14
1053 DATA 20,9F,13,4C,8F,14,A0,00
1054 DATA B9,00,02,20,5B,13,C8,90
1055 DATA 0A,18,6D,0A,13,8D,0A,13
1056 DATA 4C,B0,14,88,60,18,AD,0C
1057 DATA 13,69,41,8D,0C,13,38,AD
1058 DATA 0D,13,E9,19,90,06,8D,0D
1059 DATA 13,4C,CF,14,AD,0D,13,69
1060 DATA 41,8D,0D,13,AD,06,13,6D
1061 DATA 08,13,48,AD,07,13,6D,09
1062 DATA 13,8D,0F,13,68,6D,0B,13
1063 DATA 8D,0E,13,AD,0F,13,6D,0A
1064 DATA 13,8D,0F,13,38,E9,19,90
1065 DATA 06,8D,0F,13,4C,05,15,AD
1066 DATA 0F,13,69,41,8D,0F,13,AD
1067 DATA 0E,13,E9,19,90,06,8D,0E
1068 DATA 13,4C,1A,15,AD,0E,13,69
1069 DATA 41,8D,0E,13,A0,01,AD,0C
1070 DATA 13,CD,00,0B,D0,20,C8,AD
1071 DATA 0D,13,CD,01,0B,D0,17,C8
1072 DATA AD,0E,13,CD,02,0B,D0,0E
1073 DATA AD,0F,13,CD,03,0B,D0,06
1074 DATA 20,89,15,A4,FA,60,98,48
1075 DATA 68,4C,AF,13,A9,04,4C,AF
1076 DATA 13,A9,00,8D,00,FF,A9,20
1077 DATA 8D,00,D4,8D,01,D4,A9,09
1078 DATA 8D,05,D4,A9,0F,8D,18,D4
1079 DATA 60,20,61,15,A9,81,20,9C
1080 DATA 15,A9,80,20,9C,15,4C,96
1081 DATA 15,20,61,15,A9,11,20,9C
1082 DATA 15,A9,10,20,9C,15,A9,00
1083 DATA 8D,04,D4,60,8D,04,D4,A2
1084 DATA 70,A0,00,88,D0,FD,CA,D0
1085 DATA FA,60,END
```

END

ADVENTURE ROAD

BY SHAY ADDAMS

Look Ma— No Parser!

News and opinion from a leading explorer of those fantasy realms called adventure games.

Do you hate typing? Does the phrase "I don't know the word whatever-you-just-typed-in" sound discouragingly familiar? Then you might want to explore one of these adventures, which replace the parser with a menu- or icon-based interface. Such interfaces were once seen primarily in role-playing games like *Phantasie*, but recently they've been showing up more frequently in the logical puzzle-solving variety.

Murder on the Mississippi is the best one I've seen so far. It's like *Deadline* with graphics, a disk-drive detective story set on a riverboat steaming down the Mississippi to New Orleans. You play Sir Charles Foxworth, a British sleuth who must crack the case before the boat docks and the killer escapes. The top half of the screen shows the boat and characters, who stand an inch or so high and strut the deck with distinct motions. The bottom half shows a menu of options that include talk to character, inspect, examine evidence, accuse character, and the entire range of things a detective would do in the process of solving a crime.

You can even compare one object with another. Maneuvered via the joystick, a hand-shaped cursor simplifies choosing an option, but vanishes when you move it up into the picture to guide Foxworth and his pudgy sidekick Phelps around the ship, up and down stairs, and into staterooms on the four-decker Delta Princess.

The case won't be solved until you've talked to everyone on the ship, a varied and colorful cast. You can grill them about the victim or another passenger. The people's faces fill the top of the screen and you select one with the cursor. By guiding the hand over key words and hitting the joystick button, you can record their responses. Success requires finding the physical evidence, ferreting out a motive, and establishing that the accused had an opportunity to commit the crime.

> *The animation in* Brataccas *is so detailed that you will soon recognize a character's face as easily as that of a friend on the street.*

With an original, cartoony flair, the designers created a world with genuine personality. The animation is spiffy, the sound effects and music sparkle—you actually hear the paddle wheel churning the water, and a different tune plays when you enter each passenger's cabin. While searching the boat from pilothouse to engine room, you'll find a few action-style problems, like a knife flying at your face when you enter a room. These don't require much eye/hand coordination, and don't get in the way like the action games in the first Telarium adventures (which were ripped out of the new versions in response to player feedback). And when you get killed, it's easy to restart. A game in progress can be saved on the game disk, and you won't have to wait for the entire program to reload.

I was wondering when Activision would come up with an adventure as good as *Mindshadow*, and it looks like they've finally done it. (See the review in this issue.) Another new murder mystery with a menu-based interface is *The Scoop* from Telarium, the first adventure based on an Agatha Christie novel.

British Games Getting Better

It took them years, but some British programmers have finally learned how to produce a game that looks and plays as good as the blurb on the back of the box makes it sound. Firebird's *Elite* puts you on the bridge of a star ship, where you zip back and forth among hundreds of planets to trade exotic goods. The goal is to advance in status from Harmless to Elite by wiping out enemy ships. With more money, you can buy bigger guns and other equipment for your ship, which is necessary if you expect to survive the constant attacks of the space pirates. (It's like *AutoDuel* in space in this sense. Similarly, you can mount weapons on all four sides of your vehicle.)

Strategy is important, but there's an intense element of animated shoot-'em-up action. Remember the *Star Wars* arcade game? That's the view you get: a first-person perspective of a field of stars. Through viewports on each side, in front and rear, you'll see enemy ships depicted with a dramatic three-dimensional effect as they grow closer or recede in the distance. Menus are used for trading and other transactions, while flying the ship is handled with keyboard/joystick controls. A few logical problems await those who survive long enough, but don't climb into this ship unless your shoot-'em-up skills are as good as your logic. (See the review in the May/June, 1986, *Commodore Microcomputers*.)

Back on planet Earth, Firebird's second winner is *Frankie Goes to Hollywood*. (You've heard the band, now play the adventure.) This one takes place in the British town of Mundaneville, where you must solve 60 puzzles to score Pleasure Points and Personality Points as you strive to become a Complete Person. Some problems are object-oriented, one is a murder, others are action-style.

Using keyboard or joystick control, you guide a tall, well-animated figure through hundreds of finely detailed rooms and mazes. It's all RAM-resident, so there's no waiting for disk access when you enter a new location. Inventory is displayed in a window that opens when needed, the objects appearing as icons. This is a natural interface that can be mastered in minutes—which isn't true of the game's diverse problems. The one weak point is that you can't save a game in progress.

Two other Firebird imports, *The Arc of*

Yesod and *The Nodes of Yesod*, offer nothing new and are basically action games with little appeal for adventurers. Mindscape's *Spell of Destruction* is more intriguing. Your animated LoreMaster must solve a puzzle on each of the 71 levels of the three-dimensional dungeon in order to defeat the evil Prime Elemental with a powerful spell. Flaming fireballs, different songs for the variety of monsters, lots of seriously tough puzzles, easy-to-use joystick or keyboard control—these elements combine to make *Spell of Destruction* a uniquely satisfying variation on a classic theme. (See the review in the September/October, 1986, *Commodore Microcomputers*.)

For Amiga adventurers who like science fiction, Mindscape's *Brataccas* opens new vistas in action adventures. You control Kyne, an intergalactic fugitive who has teleported to the asteroid Brataccas in search of evidence that will clear him of "The Crime Against Humanity." Halls and elevators lead to night clubs, control rooms and secret hideaways where you encounter all kinds of characters—thugs, thieves, bartenders, even a few friends. The animation is so detailed that you will soon recognize a character's face as easily as that of a friend on the street. But there's little time to chat, for the police, the droids and the asteroid's local Mafia are all out to get you. Interestingly, combat is fought with swords instead of ray guns; you can also use energy bombs.

You never have to type a word, for a unique interface borrows from the Sunday comics to simplify talking to characters. Words appear in a balloon over a character's head when he speaks to Kyne. Then Kyne's balloon shows him thinking, "Mmm, shall I..." as he considers possible replies that are displayed one by one in the balloon. You hit the space bar or mouse button to select the reply you want.

Money bags, security passes and other objects can be picked up by having Kyne reach for them. Mouse or keyboard controls facilitate fighting and moving around, but I found it frustrating and nearly impossible to control Kyne with the mouse. Even so, and despite equally frustrating documentation, I had a lot of fun with *Brataccas*. Adventuring in *Brataccas*—yet another British import—is more like playing an animated cartoon than a computer game. (See the review in the August/September, 1986, *Commodore Power/Play*.) ■

Superbase 128

Programable Database

For the Commodore 128

Superbase the only fully programmable database for the Commodore 128. The first time I saw Superbase 128 in action was while I was in England. I was so impressed by the sheer power of Superbase that I bought several copies to manage my office better. Many of my friends and business associates wanted copies for their own use. A distribution network was born!

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The easy to use, menu driven approach means you'll be up and running in minutes.

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Continued from pg. 69

"There are over 100 different modules in Koronis Rift, *which appear in the forms of powerful weapons and highly advanced devices."*

fects like these add perspective to a game and make you feel like you're there.

Jermaine: I understand that there are robots in the game. What can you tell us about them?

Falstein: Basically there are two types of robots in **Koronis Rift.** The first robot is a Repo-Tech Robot, which sits beneath your Surface Rover. Once you locate a hulk in your area, you send him out to look it over and retrieve any technology that's in it. The second robot, Psytek, takes care of the orbiting scout craft while you're exploring the planet's surface. Whenever the player discovers a module, he has the option of calling Psytek to transport him and his discovery back to the orbiting ship. Once aboard the orbiter, the robot can analyze the new module, and tell you what it's good for.

The only hitch to this is the fact that it may cost you some time. I'm sure that some people will view this option as not being very valuable, but you actually run a certain degree of risk whenever a module is plugged into your tank's control system. After all, you're dealing with the remains of an alien testing ground where anything is possible. Some of your discoveries will be very important, a number of modules won't work properly, while others will do some very strange things. You can also leave up to eight modules in your orbiting ship for future use.

Jermaine: How did the **Koronis Rift** project begin?

Falstein: I started developing **Koronis Rift** shortly after **Ballblazer** and **Rescue on Fractalus!** were completed. I was told to come up with something I liked. My early thoughts were "What is fun in an arcade game?" Some of the answers I came up with were great graphics and unusual special effects, interesting sounds, and a situation where you have to locate and experiment with alien devices. These basic ideas survived in the finished product.

The first design meeting was held in July of 1984, but actual programming didn't begin until late in September. I remember the first design session very well, because I was expected to talk about my ideas with the group and get their reactions. Everyone tried to put me at ease. They pointed out ideas which didn't have much promise and encouraged me to concentrate on the positive ideas and thoughts generated at the meeting.

Jermaine: How did you progress into the development of the game?

Falstein: During the early days of **Koronis Rift,** Gary Winnick, a resident artist at Lucasfilm, worked with me to create a central theme for my program. We put our heads together and came up with the idea of a sophisticated tank game. Gary did a great deal of work refining ideas generated during the design sessions. Before I actually started programming, he helped me create visual images of what I wanted to do.

Originally, I planned to have the player operate a variety of controls in his vehicle throughout the game. This idea proved to be too complicated for the average player to fully understand and operate. To simplify matter, I concentrated on creating a basic control system and added a large number of unpredictable devices to the game to keep things interesting. These items are fairly easy to find in the game, but when activated, they produce unpredictable effects.

Using ideas generated in the design sessions, Gary created a **Koronis Rift** presentation package for George Lucas to look over. This sneak preview of the game was put together in the form of storyboards similar to those used in movie pre-production work. He liked most of our ideas and made a few suggestions. One suggestion was to occasionally have some of the abandoned hulks in the program turn out to be something unexpected, such as a camouflaged creature that could damage your equipment. We liked his suggestions and incorporated them into the program. George gives us the benefit of his years in the entertainment field, is interested in our work, and we always welcome his comments.

Jermaine: With the planning of the game behind you, how did the programming stage of the project progress?

Falstein: Koronis Rift could have been programmed using conventional programming techniques, but we had just finished **Rescue on Fractalus!** where we'd experimented with fractal mathematics. As a group, we decided to push fractals a step farther. (For those of you who aren't familiar with fractals, it's a special way of creating exact three-dimensional landscapes with software.)

We've been very fortunate in that many of the ideas we wanted to put into the game fit. And sometimes we ran into surprises. For instance, we knew from the early design meetings that we could create scaling flying saucers on the screen. What we didn't know was that Aric (Wilmunder) would come along, take our blank saucer silhouettes, give them color and add details to reduce the image's flat appearance.

Wilmunder: I believe that the largest programming problem we experienced during the **Koronis Rift** project was trying to put so much into one game. We determined what we couldn't accomplish with our existing hardware, then went ahead and did it anyway.

Jermaine: Does **Koronis Rift** feature some form of fast loading?

Gilbert: Yes, we've incorporated Epyx's **Fast Load** software into the program, so you don't need the **Fast Load** cartridge to load the program.

Jermaine: Is there much difference between the Atari and 64/128 versions of **Koronis Rift?**

Wilmunder: We didn't just do a 64 conversion of the game, we simultaneously developed **Koronis Rift** on both machines. When a game is being designed, we take the abilities of both machines into consideration, and do the best we can with each machine. Sometimes developers create a program on one system, and worry about conversions later.

Gilbert: But there are still some differences between the versions. The main difference is the color of the mountains on the surface of the planet. Because of the differences in the color palettes and the systems themselves, the mountains in the Atari version were constructed using shades of green, while the mountains in the Commodore game are gray.

The effects in both games are also slightly different, but equally spectacular. We have taken great care to do things on the Commodore computer that have never been done on that system before, and can't be done on the Atari. We then applied the same principle to the Atari version.

Jermaine: What is it like to work for Lucasfilm?

Gilbert: Lucasfilm is unlike any of the places most of us have worked before. The programmers not only create the games, but have almost unlimited freedom in what they can do. We all work well together, and when we set out to design something, we aim high—then go out and do it. ◼

LUSCHER

Continued from pg. 20

Conversely, a far more laid-back friend received a report advising that, "Your liveliness and curiosity make you open-minded and willing to embrace life...You should guard against being overenthusiastic and perhaps swept away by your zeal."

I ran the program repeatedly to see if I'd get different analyses by entering a variety of responses. For example, I even tried the opposite of what I'd normally pick: purple instead of orange, the black circle instead of the white one, and so on.

Sally, my alter-ego, was read by the program as being far too passive. She should avoid compromise simply for the sake of peace. She was told: "It is important for you to take the initiative and shape your circumstances so they suit you." Pretty much the exact opposite to what the real me was advised when I answered honestly, and was told to "try to understand others with patience and concern."

I think this program is intriguing and exciting, and many professionals involved in mental health and therapy may find it useful. People who are curious about themselves will also be interested in this program.

But I must warn you against using it at a party—it could be embarrassing for the gang to read a printout advising that, "You want to avoid the stress of a strong attachment." The program is really targeted to people interested in self-evaluation. Says the manual, "*The Luscher Profile* doesn't claim to let you read the minds of others. It instead allows you to understand the one person most important to you: yourself."

Any criticisms? A few minor ones. First of all, you can't use the program without the test booklet, which is separate from the manual and easy to misplace. (I know, I lost it once.) It all comes in a nice little folio, but you'll immediately remove it and forget to put it back. So I recommend the test booklet be included as part of the manual so it's assured a permanent place.

I'd also love to know what is the significance of your favorite colors. (Mine's orange.) I'm sure Dr. Luscher has strong views on this subject. *The Luscher Profile* has really whetted my appetite to learn more about the meaning of colors.

I recommend *The Luscher Profile* as a fascinating program with a unique application for your Commodore 64. Mindscape has come up with another winner. C

Superscript 128
Word Processor
For the Commodore 128

SUPERSCRIPT 128
The Better Word Processor
By Steven L. Spring
President of PP&S

Superscript 128, the intelligent word processor for the C-128 from Progressive Peripherals & Software that goes beyond the competition.

I always look for the best in new software developments. When I saw Superscript 128 in action, I knew it was the best word processor available. So I asked Precision Software of England if I could sell Superscript in the U.S. and Canada. Because of my reputation for customer service and quality products, Precision agreed.

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Superscript 128 also has a powerful mail merge facility. You can command Superscript 128 to retrieve information from your Superbase 128 files. Since both programs "co-reside" in memory together, there's no time consuming disk swapping to slow you down. Only top of the line products like Superscript 128 and Superbase 128 can integrate.

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SWIFTCALC 128

Continued from pg. 36

and contain the standard mathematical operations like addition, subtraction, multiplication, division, and exponentiation. In addition, parentheses can be used to control the order in which operations are performed. *Swiftcalc 128* also provides several built-in formulas that find the minimum, maximum, average or sum of values within a range of cells. There are also financial analysis functions that evaluate the present and future values of a dollar amount or annuity.

Logical statements can be used in your formulas to evaluate data before operations are performed. For example, if in addition to his regular commission, a salesman for your small company gets a $100 bonus for selling over $1000 worth of goods in a week, a formula could be written to automatically determine whether or not to award the bonus. In effect, it would say "IF [salesman's weekly total] > 1000 then [commission] + 100." The BASIC statement ELSE can also be used as well as other symbols like >= (greater than or equal to) and <> (not equal to).

Specific information on formula syntax and other *Swiftcalc* functions is available through special menus that are accessed via the 128's HELP key. Everything else you need to run the program can be found in the well organized user's manual which is thoroughly indexed and contains a quick-reference section, troubleshooting guide, and glossary to help beginners feel at home with the program. If all else fails, Timeworks provides a toll-free technical support hotline. This customer support combined with excellent software makes *Swiftcalc 128* a good program to consider if you're in the market for a spreadsheet. C

Timeworks' Upgrade Policy: Simply purchase the updated version and send proof-of-purchase (sales receipt) for the updated program along with your old program and the title of the Timeworks program you'd like in exchange. If the suggested retail price of the program you've selected is the same or less than the program you're sending back, include a check or credit card number for $7.70 (shipping and handling). If the suggested retail price of the program you've selected is greater than the program you're returning, include the retail price difference plus $7.70 for shipping and handling.

Continued from pg. 18

Driver's Ed

On Becoming a Successful Swinger

If *Leader Board* is your introduction to the sport of golf, your best bet would be to study the game's instruction manual. It's a comprehensive booklet that not only details the operation and options of the computer game, but also outlines the foundation of the sport itself. Once you feel comfortable with the basics of play, move to the program's driving range until you develop a smooth, rhythmic swing.

Hopefully, the tips I've provided will help you to trim some strokes off your score.

- The most important shot on each hole is the one that puts you on the green. This is called the approach shot, and is considered critical because the initial distance between your ball and the flag can have a drastic effect on your putting game. Since you should always be looking to set up the approach, if you can get the tee shot or long fairway blast to land within 120 yards of the pin, you can then use your accurate short irons to try to chip the ball within a few feet of the flag.
- At the Professional level, note that the wind will affect each club a little differently. As a general rule, the short shots, with more loft and hang time, tend to get caught up in the air currents a little longer. So when you're working around the green, be sure to adjust your aim accordingly.
- An uphill putt is always more desirable than one that must be tapped downhill, with the power of the stroke easier to gauge and the path of the ball more predictable. Unfortunately, a green's pitch can't be determined until after your ball has landed on it. But the slope will remain constant with each round you play. If you really want a competitive edge, memorize the various greens. Then when approaching the putting turf, you can give yourself a more favorable lie.
- On the manual's chart that gives the range of each club, the maximum distance listed is the yardage a ball will travel after it has bounced and rolled. When shooting over water, make sure you choose a club that will clear the hazard on a fly. Remember, golf balls do not float.

BobsTerm Pro 128

The Complete Professional Telecommunications Package For The Commodore 128

Letdown by software that makes big promises but fails to deliver? BobsTerm Pro 128, a new telecommunications software package written by Bob Lentini, won't let you down. At last, a convenient and easy to use telecommunications program that goes beyond the competition.

When Bob contacted Progressive Peripherals with his idea for a software package that combined the best features of all the other telecommunications packages, we listened carefully. It was a great idea, but this program would have to be smart too.

Everything in one place! BobsTerm Pro 128 is 100% Hayes compatible and uses all the standard Hayes commands. It has present parameters for nearly all popular modems. Just load **BobsTerm Pro 128,** and select your favorite modem. It's that simple! No other program can do it all...**BobsTerm Pro 128** is the best!

You can upload and download data in practically all protocol you'll ever encounter, including Punter and XMODEM. It even offers adjustments and escape routes to handle some of the RS-232 limitations of the Commodore 128. That's smart!

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KUNG FU II

Continued from pg. 26

exploiting it with quick offensive thrusts, and then retreating before any damage can be repaid. This is all supported by animation that is smooth and precise, requiring that players land accurate shots. Persistence, patience and lightening reflexes will prove to be attributes that earmark a winner.

But even with all of this going for it, there are still some elements of the package that just aren't up to snuff, all of which can be traced back to the one-page instruction sheet that comes packaged with this program. It's a ludicrous piece of documentation, one that doesn't even cover the basics of game play. There is no breakdown of the scoring, leaving players to guess about how points are amassed, and whether they have any effect on strength, lives, or secret passage admission. There isn't even a mention of the keyboard control option that's later offered on a disk menu. If a player doesn't own a joystick, it's up to him to use trial and error to figure out which keys do what.

While these omissions are disappointing, what's even more disturbing is the cursory four-line summarization of object and plot. Too many things are left unexplained. For instance, what type of gauntlet stands between the warrior and the princess is still a mystery to me. The order in which I meet different monsters is never consistent, and the secret passages seem to let me off in randomized locations without any rationale or progression toward my goal. It is quite possible that this challenge is not only a series of death matches, but an intricate maze as well. That would be to its benefit. But without any clue from the instructions, it's just as easy to start wondering whether any of the work you're putting into the game is ever going to pay off.

The documentation's shortcomings become frustrating only because the rest of the game is so promising. Aside from this problem, *Kung Fu II* stands as a solid arcade contest, presenting a rare duel of wits and muscle. A better one-on-one bout would be hard to find, with the thrill of watching an opponent fall after a hard-fought battle only making you anxious to take the next step. Let's hope UXB rewrites their instructions, so we can be assured that the desert road we're taking isn't a dead end. ■

Staff Rules
The Essence of Hitting

- First we'll get all you to be keyboard karate masters, then we can move on to some fighting techniques. Below is a list of the keyboard functions.

Q = Jump SPACE/Q = Clobber Head
Z = Duck SPACE/Z = Slash to Ankles
P = Move Right SPACE/P = Stab to Midsection
I = Move Left F1 = Pause

- I have been most successful against the Dark Master's forces (except the crazed Dog, which is covered next) by using a Push-Hit-Run method of fighting. First, back up to the left and let your rival advance against you. Once he has traveled three quarters of the way across the screen, move right into him until your bodies are touching. Don't worry about being injured; in these close quarters no one can make contact with a weapon. Keep leaning to the right, pushing your computer contestant back toward the screen's center. When you stop, your rival will keep stepping back to get into an attack stance. Don't give him the chance. Wind up and pop him before he is set, then make a quick retreat away from any possible retaliation, setting up the process all over again.
- The Dog is your toughest opponent. Pushing against him doesn't work, because he will continue biting at you even while you're trying to move him away. To defeat this mutt, watch his movements. Just before he attacks, he stands up on his hind legs to meet you eye to eye. When he is in that position, take a short step back, and then weaken him with a few quick thrusts to the belly. Be careful, the momentum of your stabs has a tendency to move you into his deadly jowls. Take another half step back when necessary.
- Be accurate when you're trying to smash the urn. Every miss will cost you some energy. If you're competing against someone for high score, and you're up against a creature you can easily handle, it might be a good idea to leave the vase in one piece for a couple of rounds. This will continuously reincarnate the same monster without advancing you against a more deadly opponent. ■

ROAD RALLY U.S.A.

Continued from pg. 28

Tired Tips

How to Steer Clear of Trouble

Before you slide behind the wheel of your Bantam country cruiser, you might want to check the travel tips I've listed below. A little preparation can go a long way.

- The only time you have a chance to methodically plan a travel route is before the first leg of your journey. After that, the trip clock is set in motion with no rest stops allowed. If time is ticking and you are presented with a long, complicated trek between landmarks, it's not advisable to pause and plan every step of the impending trip before getting in gear. You'll waste valuable seconds.

  Instead, simply note the names of the highways surrounding your target location, then start driving in the general direction. When your Road Indicator starts displaying a familiar route, you can then turn to your map card for more specific information.

- Road hazards come in many forms. If the radio starts flashing and you are approaching an area that has peril potential, it might be best to stop your car until the danger passes. Only one hazard at a time can become active, so if you witness an accident at some other screen location, know that you are temporarily out of harm's way.
- When you stop before a landmark, its name is automatically displayed. If you ever become lost, just drive up to any site, stop your car, and check the location against the appropriate map card. This should help you establish your bearings.
- Get to know the positions of the flag wavers in each region. Although they will only appear at randomized intervals, their locations will remain constant. And if you pass this specific area a few times during the same round, it is possible that you will find a flag waver there each time. Those bonus points can add up.
- Just as adjusting the skill level can change the difficulty of a rally, so can your choice of region. Due to area size, landmark locations and road length and direction, some regions seem harder to traverse than others. I found that the North Central and Southwest areas provide the toughest challenge, while the Middle Atlantic and New England states are a little easier.

MATRIX
The Innovative Utility Program
For the Commodore 128

Mastering computers can be a time consuming and frustrating task. Rarely does one program come along that makes it easy to get the most out of your computer.

Matrix, the new utility from Progressive Peripherals & Software, makes your Commodore 128 computer easier to use. It also makes many daily tasks a breeze with one key stroke availability.

At last, fast copiers that copy anything on 1541/1571 disk drives. Matrix has two high speed utility copiers built-in. Both copy utilites have intelligent copying schemes that automatically skip blank sectors. They usually read a whole disk at once, then write as many copies as desired without re-reading. These utilities are real time savers!

Matrix is easy to use!

Take advantage of the expanded C-128 keyboard, including the numeric keypad, and 80 column screen, while using your C-64 BASIC software. Matrix lets you use the C-128 numeric keypad, as well as other C-128 keys, in the C-64 mode! Now you can unleash the power and convenience of the C-128 with many Basic programs.

Matrix is easy to use! The Matrix help menu has twelve powerful disk functions. Instantly discover what's on your disk or determine the status of your drive. Copy, erase, or rename files quickly and easily. Even format, vaildate or duplicate disks directly from the menu. Matrix is menu driven so you get the job done quickly and easily.

Remarkable sector editor is included which permits altering information directly on a disk. Use this sophisticated tool to edit any track and sector, then view the data in decimal, hex and ASCII simultaneously. Matrix will edit sectors with errors, or correct errors themselves!

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Xtra utilities are included that will read your directory regardless of control codes or copy protection devices. There's even a one key screen dump that never disrupts your software. You can even recover scratched or deleted files with the easy to use Delete and Undelete commands. That's very nice.

Matrix creates autobooters that let your C-64 and C-128 programs load and run themselves on power up.

The time saving autoboot maker has all the features you could ever want, plus a few most users will probably never need..but some will find indispensable.

Matrix can easily define a series of operations that automatically execute on power up. This is a first for Commodore computers!

For instance, have you ever had three different programs on a disk that you needed to boot at different times? With Matrix, you create autobooters that let you select which program to load. Once the autobooter is made, just turn on your machine and your favorite programs are loaded automatically. Matrix takes care of the rest. No repetitive or time consuming typing to slow you down.

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Q-LINK UPDATE

Prepared by Quantum Computer Services

Welcome to Q-Link Update! This month, QuantumLink's ever-expanding information and entertainment network introduces the first and only on-line GEOS special interest group. And for those of you interested in the music world, there is Rocknet Live.

GEOS Special Interest Group

GEOS, the desktop operating system developed by Berkeley Softworks, now has a special interest group (SIG) in QuantumLink's Commodore Information Network. This exclusive SIG offers GEOS users the opportunity to chat with the designers and developers of GEOS, receive information on the latest GEOS developments and additions, download GEOS software updates, and attend weekly conferences designed to help get the most out of GEOS.

The GEOS SIG message board has trained Sysops on hand to share helpful hints and offer new application advice. GEOS Sysops are representatives from Berkeley Softworks who took part in the design and development of the program.

> *This exclusive SIG offers GEOS users the opportunity to chat with the developers, receive information on the latest developments and download GEOS software updates, and attend weekly conferences.*

Rocknet Live

If you have ever hummed down a hallway, tapped to a tune or bounced to a beat, QuantumLink invites you to sing on (oops, sign on) to Rocknet Live.

Rocknet Live, located in QuantumLink's Just For Fun department, offers the latest news and information from all aspects of the music industry. Live on-line conferences connect users to top musicians, writers and producers from around the globe. Computer jockeys brief you on recent vinyl and video releases, the top 10 charts, music reviews, concert dates and rock rumors.

Based in California, Rocknet's contributors consist of musicians, record label personnel and rock radio reporters. These individuals tune you into the renaissance of rock with exclusive backstage reports and industry developments. Read reports on the latest listening, recording and playing equipment. Look into the rock library for data on historical hits, music styles, videos and artists.

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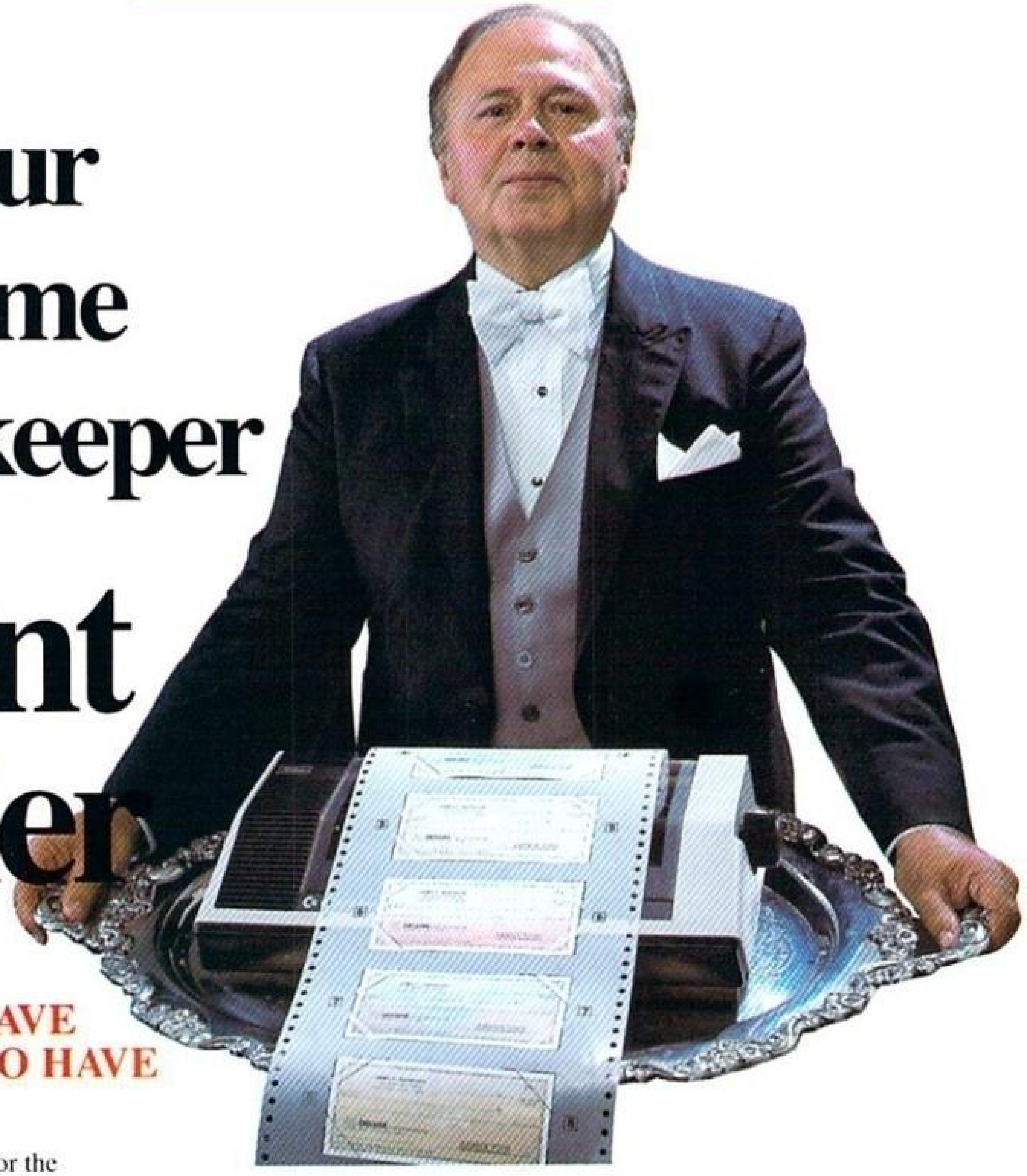

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